

***Full Length Research Paper***

Gender Analysis of Rural Dwellers' Knowledge about Climate Change Phenomenon in North Central Zone, Nigeria

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This study was designed to analyze male and female knowledge about the cause, consequences and mitigation of climate change in North central Zone of Nigeria. A multi-stage random sampling technique was employed to elicit information from 120 men and 120 women in the study area. Descriptive statistics and inferential statistics were used to analyze the data. Result from the study revealed that the knowledge level of both gender about the cause and mitigation of climate change is low, while their knowledge about the consequences is high. The knowledge of women about the causes and mitigation of climate change is lower than that of their male counterpart. However, female knowledge about the consequences of climate change is higher than that of their male counterpart. Hence, there is need for concerted action to bridge the gender gap in knowledge of both gender about climate change and to raise the knowledge of both gender on causes and mitigation of climate change to enhance their worthwhile action towards dealing with climate change issues .

Keywords: Gender analysis, Rural dwellers, Knowledge and Climate change**Introduction**

Climate change refers to a change in climate that is attributable directly or in directly to human activities that affect atmospheric condition of the earth leading to global warming. This change has a potential to affect all natural system thereby becoming threat to human development and survival. Climate change and global warming are caused by the building up of green house gases (GHG) in the atmosphere such as carbon dioxide, nitrous oxide, chlorofluorocarbons and methane as a result of human activities e.g burning of fossils fuels , bush burning, use of machine that produce smoke, e.t.c. These green house gases form a sort of blanket over the earth trapping in heat that will normally escape into the atmosphere. This lead to an increase in earth's surface temperature which is beginning to have a considerable impact on the environment and the society. (Mustapha, 2009)

Climate change has globally become a front burner issue. Federal Ministry of Environment (2009) observed that there is now physical and scientific evidence that climate of the world is changing. Evidence includes global rise in sea level, increasing desertification, drying of waters resources (River and Lakes), and increase in ambient temperature and changes in seasonal climate. It is a serious threat to poverty alleviation and sustainable development globally. Gender analysis of Skutch (2002) revealed that men and women have differential knowledge of climate change, and given the linkage existing between women and natural resources, it should be noted that women could play a crucial role in climate change mitigation.

Reynold and Wiemer (2002) were of the opinion that gender variable should be taken into due account considering that the emissions, mitigation and adaptive capacity of men and women differ as regards climate change. Women and Men differ with regard to their respective perception /knowledge of and reaction to climate change. It is well known that women especially in industrialized countries have higher risk perception than men do. Gender differences are crucial. (Delaney et al, 2000, Duncan, 2007 and Piana (2005)

Most rural dwellers in the north central zone engage in activities that could speed up the emission of green house gases such as; bush burning and cutting down of trees for fire wood and charcoal production. These activities could culminate into more adverse impact of climate change. One wonders whether they have knowledge about the causes, consequences and mitigation of climate change. Literature is rife on the fact that women are more vulnerable to the effect/impact of climate change due to their limited knowledge and low access to/ control over adaptive resources, however there are no enough empirical research to establish this fact. Hence, there is need to investigate the knowledge level of male and female in the study area.

Ascertaining rural dwellers' knowledge about climate change is vital in designing appropriate strategies towards getting them adequately informed in areas where they lack adequate information. Most research on people knowledge/ perception of climate change were carried out in the developed countries of the world. On the contrary, little attention is paid to those in the developing countries, hence they are said to be more vulnerable to climate change (Anja, 2007).

It is pertinent to collect gender disaggregated data of the rural dwellers about climate change to discover where the gender gap in knowledge lies. This will enable development practitioners, policy makers and donor agencies to know who needs more attention (men and /or women) and it what area, because International community widely recognizes gender equality as vital in promoting development, especially in developing countries.

The general objective of the study is to determine gender knowledge of rural dwellers about climate change in the study area. The specific objectives of the study are to: ascertain gender personal characteristic of respondents in the study area; determine rural dwellers gender knowledge about causes of climate change; investigate knowledge level of respondents about consequences of climate change by gender; and ascertain rural dwellers gender knowledge level about mitigation of climate change.

Methodology

A multi-stage sampling procedure was used to reach out to the respondents. Two states (Niger and Kwara state) were randomly selected from the North central states. Thereafter, three Local government Areas were selected from each of the state through stratified random sampling procedure. (i.e each state was stratified into three zones based on senatorial district and a Local Government Area was selected from each zone, making a total of three Local Government Area from each State). Hence, a total of six Local Government Areas were sampled from both states. In Niger state they are; Katcha from zone A, Paikoro from Zone B and Wushishi from Zone C. In kwara state they are Asa from Kwara Central, Edu from Kwara North and Ekiti from Kwara South.

Afterwards, a predominantly known rural community where both men and women engage in farming activities were purposively selected from each of the selected Local Government Area. Hence a total of six communities were selected from both states, the communities are; Aboto-Oja, Kanko, Isare-Opin, Madegi, Kparaka, and Danu. Lastly, forty (40) respondents, comprising of twenty male and twenty female were selected from each of the communities through cluster and systematic sampling procedure. Hence, a total of two hundred and forty (240) respondents were contacted from both States.

Measurement of Variables

Knowledge of respondents was categorized into three groups, they are; knowledge about the cause of climate change, knowledge about consequences and knowledge about mitigation.

Their knowledge about the cause of climate change was measured on five point rating scale over the extent at which they know that some selected factors could lead to climate change. The rating scales are very great extent (5) great extent (4) slight extent (3) undecided (2) and no –extent (1). The aggregate scores was later categorized into four levels of very high , high , low and very low knowledge about the cause of climate change.

Again, knowledge about consequences of climate change was also measured on a five point rating scale of very great extent (5), great extent (4) slight extent (3) undecided (2) and no extent (1). The aggregate scores was later categorized into four levels of very high , high , low and very low knowledge about consequences of climate change.

Moreover, their knowledge about mitigation of climate change was measured on a five point rating scale of very great extent (5), great extent (4) slight extent (3) undecided (2) and no extent (1). The aggregate scores was later categorized into four levels of very high , high , low and very low knowledge about mitigation of climate change.

Results and Discussion

Selected Personal Characteristics of Respondents

Data on Table 1 shows that 37.5% of the male respondents are within the age group of 61-70 years, while 41.7% female respondents are within the age group of 51-60 years. Mean age of the male respondents is 65.4years while that of the female is 57.9years. This implies that the respondents are old enough to discuss issues of climate change. Moreover, in accordance to Bates and Swan (2007) assertion, increase in age brings increase in level of vulnerability to climate change. Hence, one could say most of the respondents (male and female) are vulnerable to climate change.

Table 1: Distribution of Respondent by Age, Marital status and Religion

	Male		Female	
	Frequency	Percentage	Frequency	Percentage
Age	8	6.7	22	18.3
40-50				
51-60	25	20.8	50	41.7
61-70	45	37.5	33	27.5
71 &Above	42	35.0	15	12.5

Educational level				
No formal education	86	72.3	114	95
Primary education	22	17.6	5	4.2
Secondary education	8	6.7	1	0.8
Tertiary education	4	3.4	-	-
Years of farming experience				
≤ 30	1	0.8	36	30
30-39	28	23.5	24	20
40-49	12	10.1	29	24.4
50-59	47	39.5	25	20.8
≥60	32	26.1	6	5

Source: Field survey, 2011.

Most of the rural dwellers in the study area (72.3 % men and 95% women) are none-literates. 17.6% men and 4.2% women have primary school education. 6.7% men and 0.8% female have secondary have secondary school education. Only 3.4% men have tertiary education while none of the women have tertiary education. One could infer from the table that men have better level of education than their female counterparts, this is premised upon the belief of the respondents that when a female child is trained she will eventually get married and forget about her parents who have invested on her.

Only 0.8% men have farming experience that is below 30years while about 1/3 (30%) of the women have farming experience that is below 30years. 39.2% men and 20.8% women have farming experience of between 50-59 years. This implies that men have higher years of farming experience than their female counterpart.

Gender Knowledge about the causes of climate change

Table 2: Gender Distribution according to Perception of respondents about causes of climate change

Perceived causes of climate change	Male		Female	
	Frequency	Percentage	frequency	Percentage
Nature/God	113	94.17	118	98.33
Sin	68	56.57	96	80.0
Bad governance	-	-	1	.8
Diabolical power	-	-	26	21.67
Human activities e.g deforestation	4	3.3	2	1.67

Multiple responses

Source: field survey, 2010

Majority of the respondents (94.1% men and 98.3% women) perceived the cause of climate change to be natural (i.e from God). Some (56.5% men and 80% women) were of the opinion that the underlying factor is Sin. Some women (21.6%) were of the opinion that people at times use diabolical powers to stop rain. According to a woman during the focus group discussion, some wicked people (ritualists) do lock up rain so that it will not affect their rituals.

Only 3.3% men and 1.6% women could trace the cause of climate change to human activities.

Table 3: Distribution of respondents according to their knowledge about the extent at which some selected human activities could cause climate change

	Male		Female	
	Frequency	Percentage	Frequency	Percentage
Felling of trees				
No extent	14	11.67	96	80
Undecided	12	10.0	11	9.2
Slight extent	51	42.5	3	2.5
Great extent	37	30.83	6	5.0
Very great extent	6	5.0	4	3.3
Bush burning				
No extent	11	9.17	43	35.83
Undecided	32	26.67	50	41.67
Slight extent	58	48.33	20	16.67
Great extent	13	10.83	12	10.0
Very great extent	6	5.0	5	4.2
Burning of fossils				
No extent	14	11.7	12	10.0
Undecided	70	58.3	98	81.67

Slight extent	28	23.3	08	6.67
Great extent	8	6.7	2	1.67
<hr/>				
Lack of tree planting attitude				
No extent	13	10.8	14	11.67
Undecided	28	23.3	99	82.5
Slight extent	46	38.3	7	5.8
great extent	26	21.7	-	-
Very great extent	7	5.8	-	-
Total	120	100	120	100

Source: Field survey, 2010

Data on table 3 shows that majority of the women (80%) and few men (11.6%) were of the opinion that felling of trees has no effect on climate change. 42.5% men and 2.5% women were of the opinion that felling of trees could have slight effect on climate change. only 5% men and 3.3% women were of the opinion that felling of trees could lead to climate change to a great extent. About one-third of the women (38.5%) and very few men (9.1%) were of the opinion that burning of bush has nothing to do with climate change, while 26.6 % men and 41.6 % women could not decide on whether bush burning could lead to climate change or not. 48.3% men and 16.6% women were of the opinion it could lead to it to a slight extent. Only 5% men and 4.2% women were of the opinion that bush burning could cause climate change to a very great extent.

Again, the table also shows that 11.7 % men and 10 % women said burning of fossils has no effect on climate change. 28.3% men and 6.7% women to a slight extent felt that burning of fossils has could exacerbate climate change. Majority of the respondents (58.3% and 81.6%) could not decide on whether burning of fossils has could cause climate change or not. Very few of the respondents (6.7% men and 1.6 % women) agree to a great extent that burning of fossils could lead to climate change.

Moreover, data from the table shows that 10.8% men and 11.6% women said lack of tree planting attitude has nothing to do with climate change, while 23.3% men and majority of the women (82.5%) could not decide on whether lack of tree planting attitude could cause climate change or not. 38.3 % men and 5.8% women to a slight extent agrees with the fact that lack of tree planting attitude could lead to climate change.

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Table 4: Distribution of respondents by their aggregate knowledge level on causes of climate change

Knowledge level	Male		Female	
	Frequency	percentage	frequency	Percentage
Very low	70	58.3	114	95
Low	44	36.7	5	4.2
Highs	6	5.0	1	0.8
Total	120	100	120	100

Source: Field survey, 2010

Aggregate score 20.

Results on Table 4 shows that majority of the respondents (58.3% men and 95% women) has very low knowledge about the cause of climate change while very few of them (5% men and 0.8% women) has high knowledge about the cause of climate change. Hence, both the male and female respondents' knowledge about climate change is at its nascent level, however, women have lower knowledge of causes of climate change than their male counterpart.

Table 5: Mean and Standard deviation in the knowledge of respondents about selected consequences of climate change

Selected consequences	Male		Female	
	Mean	Standard deviation	Mean	Standard deviation
Outbreak of disease in man	3.4622	.8123	3.9012	.4333
Untimely death in man	3.5798	.8444	3.6333	.5423
Low productivity of crops	3.691	.7334	3.8833	.4561
Increase incidence of pest and diseases	3.4622	.8122	3.6417	.5681
Untimely death in animal	3.3361	.8432	3.6417	.6123
Increase in poverty level	3.7563	.7244	3.972	.4123
Extinction of some plants and animals	3.2941	.8766	3.7667	.4321
Famine	3.6891	.7423	3.8171	.5432
Conflict over resources	3.1462	.8421	3.2425	.6432
Reduction in number of farmers	3.5229	.7432	3.5122	.6564

Source: Field survey, 2010

Data on table 5 shows that the consequence with the highest mean score among the men and women is increase in poverty (M=3.7563 for men and M=3.972 for women). Among the women the next to increase in poverty is outbreak of disease in man (M=3.9012) while among the men the next to increase in poverty is low productivity of crops (M=3.691). The least perceived consequence among men and women is conflict over resources (M= 3.1462 among men and M=3.2425 among women). One could deduce from the analysis that both male and female have high knowledge of climate change consequences, however, taking a cursory look at the table it was found that women have higher knowledge about consequences of climate change than their male counterpart. This is in line with the assertion of Delaney et al, (2000) that women have higher risk perception than men. Delaney et al, 2000.

Table 6: Distribution of respondents according to their aggregate knowledge level about consequences of climate change

Knowledge level about consequences	Male		Female	
	Frequency	percentage	Frequency	Percentage
Very low	13	10.8	-	-
Low	35	29.2	4	3.3
High	59	49.2	98	81.7
Very high	13	10.8	18	15.0
Total	120	100	120	100

Source: Field survey, 2010

Aggregate score-50

Data from table 6 shows and fig 2 that 49.2% men and 81.7% women have high knowledge of climate change consequences. 10.8% men and 15% have very high knowledge about consequences of climate change. Few of male respondent (10%) has very low knowledge about the consequences of climate change. 29.2% men and 3.3% women has low knowledge about the consequences of climate change. Hence, majority of the respondents has high knowledge of climate change consequences but the women have higher knowledge of climate change consequences than their male counterpart. This finding is in line with assertion of Delany et al (2000) that women perceive higher risk than their male counterpart, premised upon the fact that they are at the receiving end of most unpleasant situation.

Table 7: Distribution of respondents on their knowledge about the extent at which some selected human activities could help in mitigating climate change.

Activities that could mitigate climate change	Male		Female	
	Frequency	Percentage	Frequency	Percentage
Avoidance of indiscriminate felling of trees				
Disagree	27	22.5	63	52.5
Undecided	45	37.5	53	44.2

Slight extent	41	34.2	3	2.5
Great extent	7	5.8	1	0.8
Total	120	100	120	100
Planting of tree				
Disagree	14	11.7	63	52.5
Undecided	15	12.5	53	44.2
Slight agree	91	75.8	4	3.3
Total	120	100	120	100
Avoidance of bush burning				
Disagree	15	12.5	64	53.3
Undecided	50	41.7	38	31.7
Slight extent	55	45.8	3	2.5
Great extent	-		15	12.5
Total	120	100	120	100

Source: Field survey, 2010

Analysis from Table 7 reveals that, 22.5% men and more than half of the women (52.5%) disagree with avoidance of indiscriminate felling of tree as a way of mitigating climate change. Above one-third of the respondents (37.2% male and 44.2% women) could not decide on whether human activities could mitigate the change or not. Some of the men (34.2%) and very few women (2.5%) slightly agree with the fact that avoidance of indiscriminate felling of trees could mitigate climate change. Very negligible percentage of the respondents (5.8% men and 0.8% women) agree to a great extent that avoidance of indiscriminate felling of trees could mitigate climate change.

Moreover, the table shows that 11.7% men and 52.5% women disagree with planting of trees as a way of mitigating climate change. 12.5% men and 44.2% women could not decide on whether it could help in mitigating climate change or not. Most of the men (75%) and negligible number of women (3.3%) slightly agree with the fact that planting of trees could help in mitigating climate change.

More than half of the women (53.3 %) and few men (12.5%) disagrees with avoidance of bush burning as way of mitigating climate change. 41.7% of the men and 31.7% women don't know whether avoidance of bush burning could help in mitigating climate change or not. Almost half of the men 45.8% and very negligible number of women (2.5%) slightly agree with the fact that avoidance of bush burning could mitigate climate change. 12.5% women agrees to a great extent that avoidance of bush burning could lead to mitigation of climate change.

Table 8: Distribution of respondents by their knowledge level about mitigation of climate change

Knowledge level on climate change mitigation	Male		Female	
	Frequency	Percentage	Frequency	Percentage
Very low	75	62.5	115	95.8
Low	40	33.3	4	3.3
High	5	4.1	1	0.8
Total	120	100	120	100

Aggregate score- 15Very low (≤ 6) low (7-9) high (10-12) and very high (≥ 13)

Data on table 8 shows that the knowledge of majority of the respondents (62.5% men and 95.8% women) about mitigation of climate change through human activities is very low. Very few of the respondents ((4.1% men and 0.8% women)) have high knowledge about the possibility of mitigating climate change through human effort. However, taking a cursory look at the table it is found just like in the previous table that the knowledge of women about climate change mitigation is lower than that of their male counterpart.

Table 9: Testing significant relationship between some selected socio-economic characteristics of respondents and their knowledge about the cause of climate change using Pearson Product Moment Correlation tools.

	R	Probability	N	Remarks
Male				
Age	.161	0.68	120	Not significant
Marital status	.171	0.06	120	Not significant
Years of formal education	.445**	0.00	120	Significant
Years of farming experience	.065	.005	120	Not significant
Total access to information	.793**	0.00	120	Significant
Female				
	R	Probability	120	Remarks

Age	.178	.067	120	Not Significant
Marital status	.192	.036	120	Not significant
Years of formal education	.345**	.229	120	Significant
Farming experience	.229*	0.12	120	Significant
Total access to information	.714**	0.000	120	Significant

**correlation is significant at 0.01

*correlation is significant at 0.05

Result on table 9 shows that among men, years of formal education and total access to information has relationship with knowledge about the cause of climate change. Hence those that are well informed have better understanding of the cause of climate change. Moreover, among the women years of formal education, years of farming experience and total access to information has relationship with knowledge about the cause of climate change.

Table 10: Testing significant difference between male and female knowledge about climate change using Mann - Whitney tools.

Knowledge variables	Gender	N	Mean rank	Assymp. Sig. (2-tailed)	Outcome
Knowledge on cause of climate change	Male	120	165.45	0.000	Significant
	Female	120	75.98		
	Total	240			
Knowledge about consequences of climate change	Male	120	169.23	0.001	Significant
	Female	120	199.78		
	Total	240			
Knowledge about mitigation	Male	120	160.03	0.000	Significant
	Female	120	66.03		
	Total	240			

Source: Field Survey, 2010

Data on table 10 shows that there is significant difference between male and female knowledge about climate change. Hence, the null hypothesis is rejected. The tool used established the fact that the mean rank for knowledge of men about causes, and mitigation of climate change is statistically higher than that of their female counterpart while the knowledge of women about consequences of climate change is higher than that of men. This implies that women perceived more risk than men because they are at the receiving end of most unwholesome situation.

Conclusion and Recommendations

Consequent upon the findings of the study (men and women have very low knowledge about the cause and mitigation of climate change, and women knowledge about the cause and mitigation of climate change is lower than that of their male counterpart. Moreover, respondents with high level of information and education have better knowledge of climate change) Hence, it was recommended that:

Government, non- governmental organization (NGO), community based organizations, development agencies, agricultural extension workers and donor agencies should be involved in educating rural dwellers on the issue of climate change.

Rural dwellers should be sensitized about the fact that it has been scientifically proven that climate change is not only caused by nature but by some of their activities such as ; bush burning, deforestation e.t.c. this will go a long way in changing their negative disposition toward climate mitigation.

Information medium that is easily accessible to the rural dweller e.g town criers should be utilized in disseminating information about climate change issues.

Women should always be mobilized to participate in discussions that borders on climate change because the study revealed that their knowledge about causes and mitigation of climate change is lower than their male counterpart

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