Adaptive Response Strategy of Farmers to Changing Rainfall Averages in Parts of South-Eastern Nigeria

AFANGIDEH, A. I.
Senior Lecturer in Climate Science
Department of Geography & Environmental Science, University of Calabar, P.M.B 1115, Calabar, Nigeria
E-Mail: idehideh@yahoo.com

AKPAN, P. A.
Prof. in Geography, University of Uyo, Nigeria

ANIAH, E.
Prof. in Geography, Department of Geography & Environmental Science
University of Calabar. P.M.B 1115, Calabar, Nigeria

OKON, ASUQUO E.*
Department of Geography & Environmental Science, University of Calabar, P.M.B 1115, Calabar, Nigeria.
E-Mail**:** Asuquo4sec@yahoo.com; asuquo4sure@gmail.com

Abstract
The variable and changing nature of the annual rainfall regime in the study area poses the main problem for which planet responses are needed. The study is conducted with an estimated population of six thousand (6000) food croppers from Abia, Akwa Ibom and Cross River States. Three thousand (3000) respondent farmers are then drawn from six (6) agro-ecological zones, two from each of the sample states at five hundred (500) respondents per zone. Two hundred and fifty (250) farming households and finally sampled from the zones resulting in the one thousand five hundred (1500) sample that the study is based. Statistical evidence indicates that the awareness level of the peasants to the issue is significant at the 95% level of confidence. The main response strategies from analysis include the application of chemical fertilizers, the use of crop verities and changing the time of farming. The main change stimuli, however are higher annual intensities and declines in the duration. Response strategies however vary significantly across the study space at 95% probability. Cross River State, the more vulnerable to the threat is suggested to be the source of the significant variation following the Scheffe Post HOC analysis.
Keywords: climate change response stimuli, response strategy, reactive response.

1.0 Introduction

Adaptation refers to both the process of adapting and to the condition of being adapted. The term has specific interpretations in particular disciplines. In ecology for example, adaptation refers to changes by which an organism or species becomes fitted to its environment (Lawrence, 1995) whereas in the social sciences, adaptation refers to adjustments by individual and the collective behavior of socio-economic system (Denevan, 1983, Hardesty 1983). This research however follows Carter et. al., (1994), IPCC (1996); Smith et. al., (2000) in a broad interpretation of adaptation to include adjustment in natural or human systems in response to experienced or future climatic conditions, their effects or impacts which may be beneficial or adverse. As both a process and a condition, adaptation is a relative term, involving an alternation in something (the system of interest, activity, sector, community or region) to something, (the climate-related stress or stimulus).

Most impact and adaptation studies to date have been based on climate change scenarios that provide a limited set of possible future climates yet the climate change related stimuli for which adaptations are undertaken are not limited to changes in average annual conditions as such include variability and associated extremes. Climatic conditions are inherently variable from year to year and decade to decade (Afangideh, Akpan and Udofia, 2012).

Variability goes along with and is integral part of climate change (Mearns et. al., 1997, Karl and Knight, 1998; Berz, 1999; Hulme et. al., 1999). Thus adaptation to climate change necessarily includes adaptation of variability (Hewitt and Burton, 1971; Parry et. al., 2004; Kane et. al., 1992). Downing et. al., (1996), Etkin (1998) etc and others use the term 'climate hazards' to capture those climate stimuli, in addition to changes in annual averages to which the system of interest is vulnerable. Natural and human systems have adapted to spatial differences in successions to temporal variations notably deviations from the annual average conditions on which climate change scenarios focus. Adaptation come in a hug variety of forms; autonomous or spontaneous adaptations are considered to be those that take place invariably in reactive response (after initial impacts are manifested), to a climate impulse or stimuli without the directed intervention of a public agency. Estimates of

this autonomous adaptation are now used in impact and vulnerability assessment (IPPC, 2000). Planned adaptations can be either reactive or anticipatory (undertaken before impacts are apparent0. in addition, adaptation can be short or long term, localized or widespread, and they can serve various functions and take numerous forms.

Demonstrating the fact that adaptive measures have the potential to significantly alleviate adverse impacts of climate change and to benefit from opportunities associated with change climatic conditions, Rosenzweigh and Parry (1994) have been able to demonstrate that with adaptation assumed food production is increased under climate change in many regions of the world. Downing (1991) demonstrates the potential of adaptation to reduce food deficit in Africa from 50 to 20% while Mendelssohn and Dinnar (1999) estimate that private adaptation reduce potential climate change dangers in India's agriculture from 25 to 15-23%.

However, given the fact that the global environment, specifically the weather and climate sub-system is fluctuating and changing in response to the controls as well as the anthropogenic forcing; sub-Saharan Africa is listed amongst the worst hit as easily captures through incessant food crises from perennial droughts and flooding (Afangideh, Akpan, Udofia and Ukeh, 2012).

Preliminary analysis of the temporal trends in the annual averages from rainfall and temperature for Uyo, Akwa Ibom State, reveals a significantly declining temporal trend at 95% confidence for rainfall (Afangideh and Ekanem, 2005, Afangideh, Okpiliya and Eja 2010). A direct but significant relationship in however established for annual temperature averages and socio-economic development within the same period in the study. In summary therefore, given the global climate change problem with countries of Asia, Africa and Central America the most vulnerable to the risks, what is the level of awareness and the response options to the problems by the vulnerable peasant farming populace to the problem in the study area.

1.1 Study Objectives

The overall aim of the study is to establish the awareness level and main response strategies of food crop farmers. Towards the attainment of the stated aims are the following objectives.

1) To determine the awareness level of the respondent food crop farmers to rainfall changes;
2) To establish the spatial pattern and main response strategies to the problem.

1.2 Conceptual Framework

Two fundamental concepts are essential to the proper understanding and explanation of the main issues in the study. Considered frameworks are the anthropogenic climate change and concept the Piaget – Wermer Equilibrium Space Conceptions theory.

The anthropogenic concept of weather and climate change believes that the climate had changed and is currently changing due to a wide range of natural factors which operated over a variety of time scales. Nonetheless, with the increasing human population and the rising levels of technology, urbanization etc etc, it is now apparent that over the last century, man has probably become a significant factor in the change. (WMO/TOGA, 1990). This assertion, decade latter became the rallying point of the United Nations and its subsidiary, the World Meteorological Organization (WMO) at it conferences and meetings. Agencies of the United Nations such as the Inter-governmental Panel on Climate change (UNFCCC) the United Nations Environmental Programme on the premise that the degradation on the Earths natural systems, are in response to the growths and development in human population, urbanization, science and technology. The continued burning of fossil fuel coupled with tropical deforestation, agricultural activities, urbanization and industrialization are adding unprecedented amount of carbondioxide into the atmosphere. Out-going long-wave radiation is thus grievous consequences on temperature and annual rainfall. Consequently, the increase carbondioxide levels directly leads to increased surface temperature by between 1.5 and 3.0^0c while indirectly, precipitation is slowly but steadily decreasing in sub-Saharan Africa and rising elsewhere (Ramanathan, et. al., 23001; Rosenfeld, 2000, Hennessy et. al., 1997). (Figure 1).

Urbanization/Industrialization Agr4icultural Activities,
and Transportation Activities
↓
Increased surface Albedo
↓
Reduced Absorption of surface energy
↓
Surface cooling
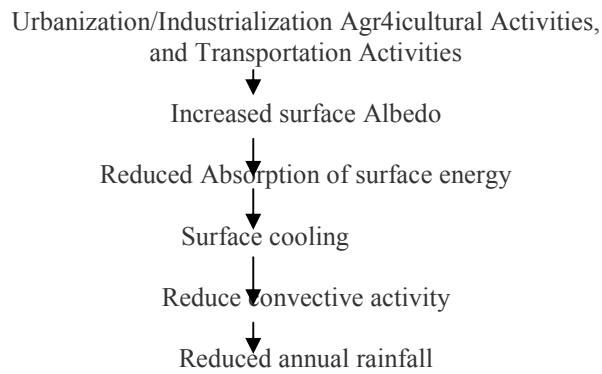↓
Reduce Convective activity
↓
Reduced annual rainfall

Fig. 1: The Anthropogenic Process, after Goudie (1978).

Piaget's Wermer Equilibrium Conception of Space Theory

The Piagets Equilibrium theory (PET) of Space Adaptation maintained that cognitive development human is a function of interactions between the person and the environment. According to him therefore, 'the key to learning is the concept of adaptation which is the reciprocal function of assimilation and accommodation'. Assimilation entails acquisition of knowledge about the environment on the one hand, accommodation involves the adjustment of existing knowledge and facts about the eventual word in the light of this knowledge assimilated on the other hand (Pocock and Hudson, 1978). Both assimilation and accommodation work continuously and reciprocally to bring about changes in the persons perception of the external world or his recreation to it. Both processes thus work to equilibrium, albeit new, being the state of balance between the two functional stages (Pocok and Hudson, 1978; Ebong et. al., 2004)
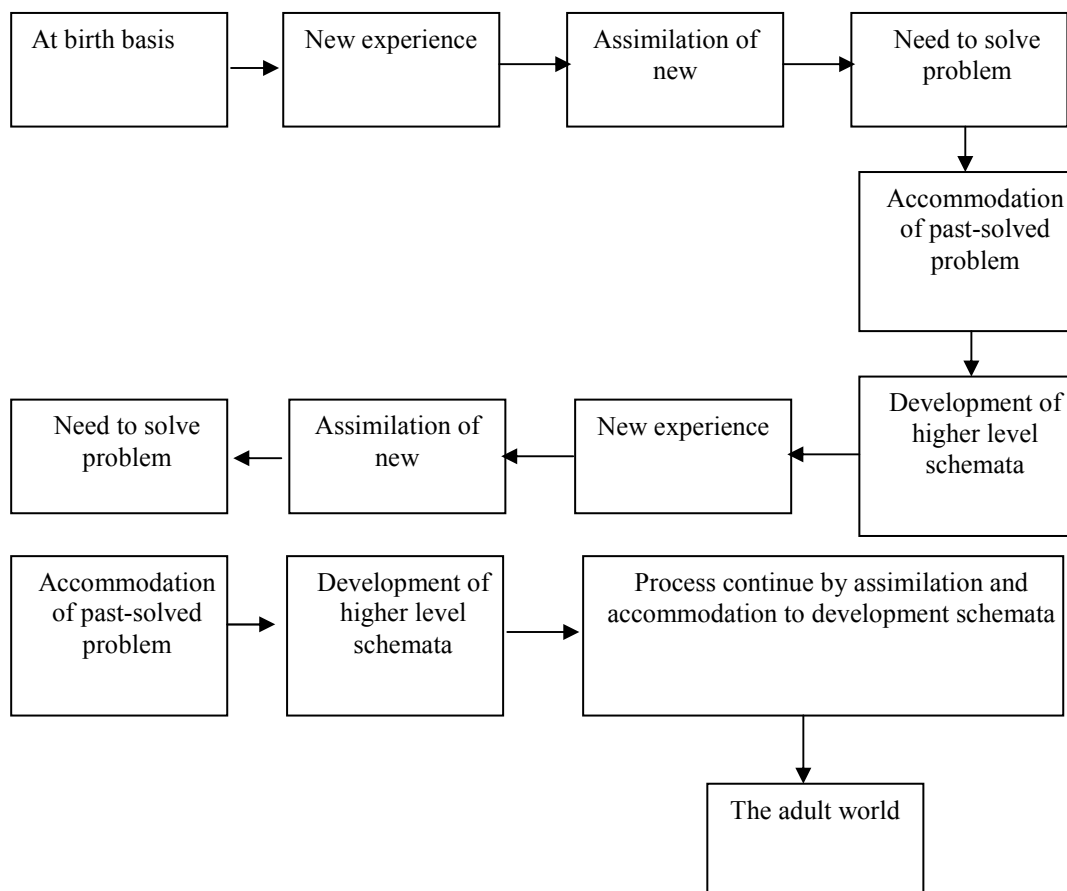

Fig. II: Piagets Theory of Space Adaptation scheme after Gold, 1988.

The process of adaptation in other words may be likened to a subtle mechanism which goes through gradual stages for the individual pieces of become more stable (Bell et. al., 1996, Ebong et al 2004). Through the

cognitive process of assimilation and accommodation, it must be emphasized, the average farmer in the study area, is able to change or vary his farming activities in other to adapt to the emerging climatic environment for sustainability. With timely and appropriative adaptive response strategy the farmer, agricultural productivity can be stabilized and increased while the risk of food crises and insecurity may be averted.

2.0 RESEACH METHODOLOGY
This section presents the research design, description of the study area, population of study, sample size and sampling procedures adopted. It also describes the instrumentation validation and instrument reliability. Finally, the statistical frameworks utilized for hypothesis testing and discussions.

2.1 Study Area
The study is conducted across three states namely, Akwa Ibom State, Abia and Cross River State, in Humid South Eastern Nigeria, it is based on the Agro-ecological zones sculptures from the Agricultural Development Projects (ADPs) of the Federal Government of Nigeria. the agro-ecological zones of study therefore comprises Abak, Uyo, Eket, Etinan, Oron, Ikot Ekpene (for Akwa Ibom state), Ogoja, Ikom Calabar (for Cross River state) and Aba, Ohafia, Umuahia (for Abia State) Fig. III. The major food crops grown in the states are cassava, yams garden eggs, maize, (*Telferia occidentalis*), water leaf, okro, pepper, afang (*Gnetum Africanum*). Apart from the northern parts of Cross River State with the tropical savanna climate type, the other states are well within the humid tropics (Afangideh et.al, 2012)(Fig. III).
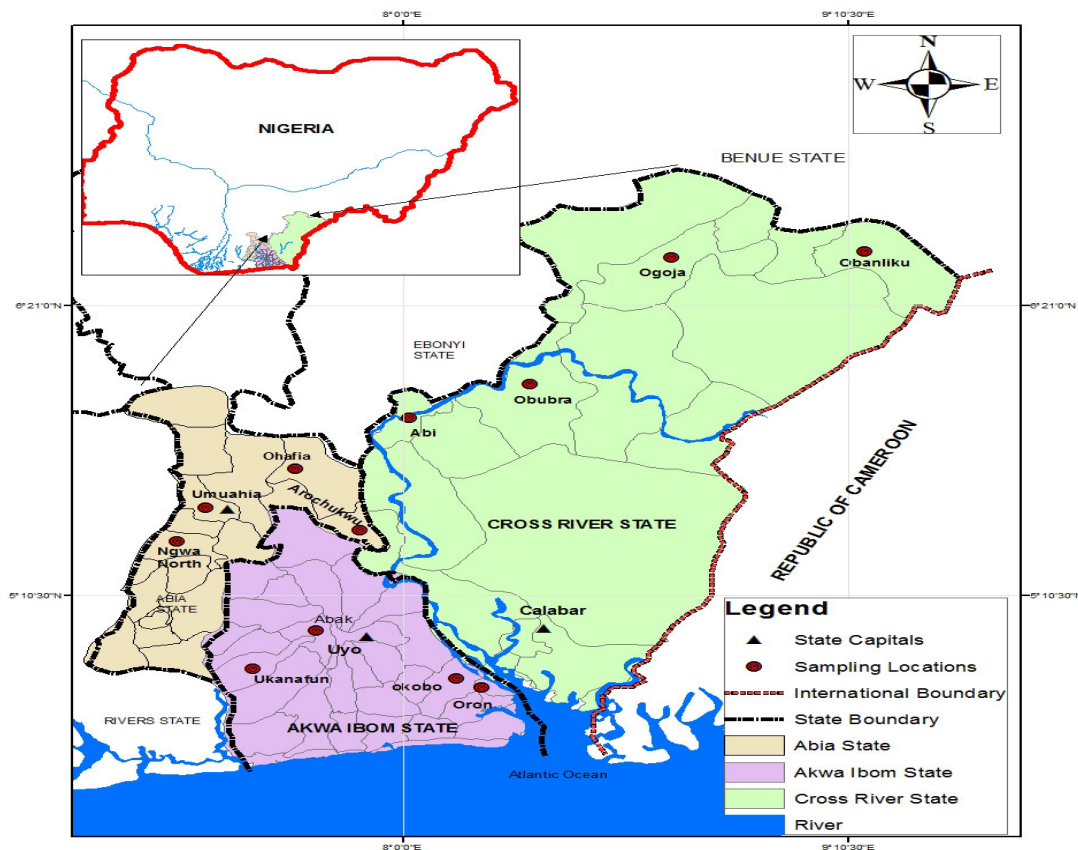

Fig. III: The Study Area
Source: Culled from ADP, 2002

2.2 Population of Study
The population of this study comprises all the agro-ecological zones of the three states and the corresponding, local government areas. Consequently, the twelve (12) agro-ecological zones for Akwa Ibom, Abia and Cross River constituted the study population.

The study is conducted with an estimated population of 6,000 respondents (500 per ecological zone). There are about 291, 131 farm families in Cross River State, (Udoh, 2001, CRADP, 2000, 2001, 2002). Also, 342, 131 AND 210, 236 for Akwa Ibom and Abia state respectively (AKADEP, 2002; ABADEP 2000).

2.3 Sample of Study

The need for sampling in this study results from the desire to obtain external validity and also to eliminate problems associated with most research such as population size, cost in terms of finance, time, greater speed and accuracy as well as accessibility to the population (Ibanga, 1992; Osuala, 2001).

Consequently, out of the total population of 6000 staple crop farmers, 3000 respondents are drawn from six (6) agro-ecological zones (two zones from each of the three states). Two hundred and fifty (250) respondents are sampled from each agro-ecological zone giving a total of 1500 farmers randomly selected for they study, table 1

Table 1: Selection of Respondents

Agro-ecological zone	Number Of respondents
Ohafia	250
Umuahia	250
Abak	250
Oron	250
Ogoja	250
Obubra	250
Total	1,500

This sample represents 25% of the estimated population under study

2.4 Sampling Techniques

The sampling procedure adopted for this study is the multi-state random sampling technique in which a purposive sampling of two agro-ecological zones is done initially. In the second zones are randomly selected giving a total of twelve local government areas. Five farming communities are selected in each of the local government areas using stratified random sampling technique. From the resulting 60 farming communities, 25 farming house holds are randomly selected making a total of one thousand five hundred (1500) respondents for the study. Table 2.

Table 1: Field Questionnaire Analysis

LGA	No Admin	No Returned	No Rejected	No Used	% response
Ohafia	125	113	8	105	84.100
Arochuckwu	125	108	6	102	81.60
Umuahia	125	121	14	107	85.60
Ngwa North	125	101	-	101	80.60
Abak	125	114	2	112	89.60
Ukanafun	125	123	4	119	95.2
Oron	125	102	6	96	76.80
Okobo	125	98	-	98	78.40
Ogoja	125	111	0	11	88.80
Obanliku	125	120	11	109	87.20
Abi	125	108	5	103	82.40
Obubra	125	123	7	116	92.80
Total	1500	1344	63	1,279	85.28

Note: A dash (-) means non – rejected.
Source: Field Data Survey, 2006

2.5 Instrumentation

This study utilizes the questionnaire, unstructured oral interview and participant observation methods to collect data. A questionnaire can be referred to as a set of questions that are related to the purpose of the study to which the respondents are to respond. Such structured questionnaire seeks the respondents' opinion, knowledge or suggestion on the implication of changing rainfall patterns to cropping in the study area. The questionnaire involves the close and open-ended format and is structured in a manner to cover all the variables under investigation. The face-to-face method is used to administer because apart from ensuring a high response rate, the possibility of misinterpretation is eliminated as either the researcher or the trained field assistants are available to explain what the respondents may not have understood. The Likert – type response categories are preferred because apart from other advantages, increase comparability of responses in the respective agro-ecological zones are guaranteed.

The face-to-face interpersonal role situation is used by the interviewer to ask questions that are responded orally.

This technique is appropriate because it allows the researcher to get first hand details about the respondent's experience and knowledge in their respective zones. However, information from the oral interview is seen as useful in corroborating the data gathered from the questionnaire.

2.6 Validation of the instrument
The questionnaire is tested using a pilot study technique where the questionnaire is administered to 150 respondents in the six sample agr0-ecological zones – representing 10% of the respondents sample for their responses. The essence of this point study, however, is to test how it will work and how it can be improved upon or modified for proficiency. It is also to make sure that the questions are the right ones and properly worded; the questions are in the right order; the right people are being interviewed. After the exercise however, some modifications are made through expert counseling leading to the restrictive of some questionnaire items.

2.7 Data Analysis
Descriptive and interferential statistical procedures are heavily relied upon for objectivity regarding the study questions and objectives. For instance, analysis of the respondents level of awareness to the problem require the percentage analysis of the mean responses and the chi-square contingency test for scientific conclusions. The analysis of variance test statistic is on the other hand, utilized for ascertaining the significant differences existing in response strategize across the study area. The rejection levels for both hypotheses have been set at 95% confidence level.

3.0 RESULT AND DISCUSSION
3.1 Rainfall Changes Awareness of Farmers in South-Eastern Nigeria
A change in the annual average regime for an regime for an element of the weather and climate can take place in one or more of the forms listed below – changes in the frequency (Trenberth however been termed the 'climate change stimuli' necessitating adjustments within eh weather and climate sensitive systems including agriculture (Smith and Pilfosova, 2001; LPCC, 1998).

This section, however, analyses the awareness level of food crop farmers engaged in the farming business for up wards of thirty years. The respondent farmers business for up their levels of agreement with respects to the five rainfall change stimuli measured using – the Likert scale instrument, with four assessment scales – Highly Aware, Aware, Fairly Aware and Not Aware.

To analyze the field data generated, frequency counts and percentages are used. 'Strongly Aware' and 'Aware' responses have been collapsed into one response grouping "Aware" while 'Fairly Aware' and 'Not Aware' category. (Table III A, B, C, & D)… from the rainfall changes awareness rankings for croppers in South-eastern Nigeria, it is shown that the level of awareness for changes in the duration of the annual rainfall regime is ranked first among other climate change response stimuli by the mainly humid tropical sample.

Table 3: Rainfall Changes Awareness Analysis in South-eastern Nigeria
A. Akwa Ibom State Awareness Assessment

S/N	Rainfall response stimuli	Yes			No		
		Freq	%	Rank	Freq	%	Rank
1	Change in amount	233	56.6	3	182	43.6	4
2	Change in intensity	245	59.6	2	170	41.4	5
3	Change in frequency	190	45.2	6	230	54.8	1
4	Change in duration	260	62	1	155	38	6
5	Change in the spread	199	49	5	216	52	2
6	All of the above	211	50	4	204	49	3

B. Abia State Awareness Assessment

S/N	Rainfall response stimuli	Yes			No		
		Freq	%	Rank	Freq	%	Rank
1	Change in amount	244	51.7	3	177	42.1	4
2	Change in intensity	260	61.1	2	161	38.9	5
3	Change in frequency	211	50.9	4	204	49.1	3
4	Change in duration	270	64.1	1	151	35.9	6
5	Change in the spread	197	46.7	5	224	53.3	2
6	All of the above	175	41.7	6	246	-	1

C. Cross River State Awareness Assessment

S/N	Rainfall response stimuli	Yes			No		
		Freq	%	Rank	Freq	%	Rank
1	Change in amount	303	69.7	1	133	33.3	6
2	Change in intensity	250	57.3	5	186	42.7	2
3	Change in frequency	280	60.4	3	177	39.4	5
4	Change in duration	295	64.3	2	176	35.7	3
5	Change in the spread	281	64.4	4	155	35.6	4
6	All of the above	231	55	6	197	45.1	1

B. Grand Awareness Assessment

S/N	Rainfall response stimuli	Yes			No		
		Freq	%	Rank	Freq	%	Rank
1	Change in amount	790	61.7	1	489	38.3	5
2	Change in intensity	670	53.3	4	600	47.7	2
3	Change in frequency	696	54.4	3	583	45.6	3
4	Change in duration	790	61.7	1	489	38.3	5
5	Change in the spread	755	56.0	2	524	44.0	4
6	All of the above	623	48.8	5	647	51.2	1

Source: Field Data Survey, 2006

States of Akwa Ibom and Abia. In the past few decades or so however the annual rains usually gets well into the month of December with a somewhat extension in the duration (Table 3A and B). For Cross River State, the changes in amount, spread and duration are the first three rainfall stimuli by ranking for which the farmers are well aware of from analysis. Corresponding frequencies and percentages are 260 (62%) and 270(64.1%) for Akwa Ibom and Abia States while Cross River has 303 (69.7%), 281 (64.4%), 280 (64.3%), for the first three stimuli with highest awareness levels. This findings only suggest a possible shift forward in the onset and cassation dates to corrobate an earlier findings by Afangideh et. al., (2007) of late farm preparatory activities and planting of common food crops such as maize, pumpkin, yams and cassava due to the delayed onset of the summer rains for Abia and Akwa Ibom States. Situated almost entirely within the tropical savanna region excepting the tiny southern, portion, Cross River is more at the risk of climate change impacts. Late onset and declining down pours contribute to poor harvest and higher agric products prices. The awareness level is high relative to the other sample states. On the whole however, rainfall change response stimuli with high awareness level include the change in duration 790 (61.7%), intensity 790 (61.7%) and spread 755(56%) (Table 3D).

The test for statistical significance regarding the two broad response groupings using the data in table 3D with the contingency chi-square test at 95% confidence and (R-1) (C-1) = (6-1) (2-1) = 5 degrees of freedom is positive with the rejection of the null hypothesis ($y^2{}_c > y^2{}_t = 71.17 > 11.07$).

Table 4: Contingency Table

0		E	0		E
799	/	728.8	489	/	559.7
755	/	723.1	524	/	555.8
696	/	723.1	583	/	555.8
790	/	728.2	489	/	559.9
670	/	718.0	600	/	551.9
623	/	719.2	647	/	552.7

$Y^2 = 6.8 + 1.0 + 5.2 + 3.2 + 12.3 + 8.9 + 1.7 + 1.4 + 8.7 + 4.3 + 16.3 = 71.17$.

The people's awareness level of the changing annual rainfall vis-à-vis the change in the amount, intensity, frequency, duration and spread is significant and in tandem with an expected or theoretical postulates at 95% confidence. The general state of poverty and the lower standard of living prevalent amongst the peasant farming populace are seeming indicators of poor harvest due partly to a changing and variable rainfall regime amongst other factors. While Abia and Akwa Ibom farmers may be faced with the problem of flooding and erosion of farmlands, Cross River counterparts are encountering change and variability in duration and amount. The level of awareness is higher to the extreme north of the state therefore.

3.2 Response Strategies of farmers in Southeastern Nigeria
In analyzing the adaptive responses of respondent farmers in the study area respondents are to indicate their levels of agreement or disagreement through an assessment instrument of fifteen response items. In the process however, adaptive responses state by state are merged together thus 'Agreed' responses are added together

resulting in 'Agree' responses while 'Strongly Disagreed' and 'Disagreed' have also been merged to produce the 'Disagreed' responses, Frequencies and percentages have been utilized for ease of description.

Table 5: Adaptive Response Strategies of Food Crops Farmers in Southeastern Nigeria.

S/N	Response Strategies	Agreed	%	Rank	Dis-agreed	%	Rank
1	Change in farm strategy	575	45	6	703	55	9
2	Adopt crop spacing	626	49	5	652	51	10
3	Appease the gods	168	13	11	111	86	3
4	Plant adaptive crops	713	55	4	566	45	11
5	Solve susceptive crops	359	28	9	920	72	5
6	Apply chemical fertilizer	959	75	1	320	25	15
7	Change time of farming	727	57	3	487	33	13
8	Use crop varieties	767	60	2	512	40	12
9	Apply new technologies	273	21	19	1006	78	5
10	Adopt institutional policies	5.7	4.5	13	1373	94.7	2
11	Take insurance policies	21	1.7	14	1258	98.1	1
12	Apply moisture conserving practices	713	55	4	566	45	11
13	Hybrid selection	401	31.4	8	878	68.6	7
14	Crop substitution	486	38	7	793	63	8
15	Change occupation	140	11	12	1139	83	4
16	Any other strategy	Nil		14	Nil	-	

Source: Field Data Survey, 2006.

Descriptive analysis reveals that a greater proportion of respondents (50% and above) tend to agree that three major strategies are adopted namely application of chemical fertilizer (75%); change of time of farming (57%), use crop varieties (604%). The analysis also shows that less than fifty percent of the respondents appear not to agree that they adopt the remaining twelve response strategies. The twelve response strategies seldomly used from the analysis include the change of farm strategy, adoption of crop spacing, appeasing the gods, planting of adaptive crops. Storing of susceptive crops, application of new technologies, adoption of institutional policies, taking of insurance policies, hybrid selection, crop substitution and the abandonment of farm business. The application for chemical fertilizer for fertility maintenance against sheet erosion in the humid states (Akwa Ibom and Abia) or nutrition enhancements in the more tropical Cross River State, is shown as the single most dominant response strategy with 75% adherence. The use of chemical fertilizers must be controlled or totally eliminated for other environmental friendly methods e.g agro-forestry and application of organic manure etc. methane (CH_4), the gaseous by product of chemical fertilizers, is known to be three-times a green house gas than carbondioxide (CO_2). In summary it may be concluded that the response strategies are either limited because of low exposure to the risk or the skill to adjust is lacking.

The test for significant spatial variability of the responses across the research sphere with the analysis of variance test statistics suggest significant variation at 95% confidence level and (N-3) = 45 degrees of freedom (fc > ft = 13.46 > 2.12) (Table 6 ABC).

Table 6A: Descriptive Statistics and ANOVA Analysis of Response Strategies. A Descriptive Statistics.

Sample states	N	X	SD
Abia	425	23.93	4.486
Cross River	439	26.19	2.7699
Akwa Ibom	415	23.85	4.536
Total	1279	24.61	3.931

Table 6B: Anova Table

Source of variation	Sums of squares	Degrees of freedom	Mean square	F-Radio	Probability level
B/w	467.620	2	233.810		
Within group	22694.90	1276	17.786	13.46	0.001
Total	23162.52	1278	251.598		

F – Ratio = Higher source of variance

                   Lower source of variance

              = 233.810

                   17.780

              = 13.46

To find out the source and direction of the significant variation among the three sample space, the Sheffe Post HOC analysis is initiated with the Sheffe test.

Table 6c: Scheffe Post HOC Analysis of Influence of Location on Response Strategies.

Farm location	One	Two	Three
One		0.000*	0.000*
Two	0.000		0.962N/S
Three	.000	0.962	

Please Note: * Significant at 0.01 probabilities.

That Sheffe post HOC analysis suggest the existence of significant difference between locations one and two and, also between one and three. There seems however not to be significant variation between locations two and three. These significant variation between locations two and three. These findings point to the fact that the source of the mean difference in the response strategies is Cross River (location one) with a higher mean response difference of 26.1971 relative to the others.

A response, broadly speaking, is any action taken by any region, nation, community o individual to tackle or manage environmental change in anticipation or after such have been experienced (Klein, 2002; Hulme et al., 199). Often more than one adaptive response options are available with the people rarely choosing the best option(s) due to established preference, little perceive risk, the lack of awareness, skills and financial resources etc (Tompkins and Adger, 2003; Mizina et al. (1999); Burton (1997), Smith & Pilifosova (2003). Also proposed inclusion of development goals e.g social well-being instead of focusing solely on environmental management to stimulate responses.

The autonomous response strategy of the peasants in the study is reactive, after initial impacts however minimal, is manifest without the direct intervention by the government or agency of the government. The distributional choice of the response strategies and the conclusions from the test of the response strategies and the conclusions from the test of hypothesis are most illuminating. Food crop farmers from Cross River State appear to be at a higher risk hence the relatively higher levels of awareness and adaptive responses (compare averages and standard deviations on Table 6A). The other two zones of the study do not seem to be at any serious risk except flooding and erosion being located well Humid Tropics with an all-year round moisture laden convective activity.

4.0 Conclusion

The study areas, excepting Cross River State, do not seem to be in serious threats of the impact of the global warming and climate change for now. The study has also thrown in the initial lights on the totality of the knowledge and the response actions and options of the respondents. There may still be the urgent need however for the economic wealth, information, skills and technology of the farmer in general, to be enhanced for a more efficient, and planned response actions when the real need arises. Global warmings and climate change issues are merely been reaslized and researched into. It may be getting worst and complex by the day if nothing concrete is put in place to check or counter same.

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