

Futo Journal Series (FUTOJNLS)
 e-ISSN : 2476-8456 p-ISSN : 2467-8325
 Volume-3, Issue-2, pp- 35 - 42
 www.futojnls.org

Research Paper

December 2017

Crop Farmers' Willingness to Accept Adaptive and Mitigation Strategies to Climate Change in Idemili-South Local Government Area, Anambra State, Nigeria.

Unaeze¹, H.C and Uzochukwu², I. K.

Department of Agricultural Economics and Extension, University of Port Harcourt, Port Harcourt, Rivers State, Nigeria¹

Corresponding author's email: unaezehenry@yahoo.com

Abstract

The study investigated crop farmers' willingness to accept adaptive and mitigation responses to climate change in Idemili-South Local Government Area of Anambra State, Nigeria. The specific objectives of this study were to describe farmers' socio economic characteristics, ascertain farmers' awareness of climate change in the study area; ascertain willingness to accept compensation to practice climate change adaptive/mitigation response programs in the study area by the farmers, identify the various types of adaptive/mitigation activities farmers practice in the study area; and identify the constraints encountered by farmers in practicing adaptive/mitigation measures in the study area. A total of eighty respondents were selected from four communities in the study area using a multistage sampling technique. Data were collected using structured questionnaire and interview schedule. Descriptive statistics and contingent valuation method (CVM) i.e. willingness-to-accept model were used in the assessment. The result revealed that the majority (81.25 %) of the respondents were male while (60 %) fell between the age ranges of 45-56years, and (60 %) are aware of climate change in the study area with a mean score of 3.48. The result from the Contingent valuation method showed that 55 % of the respondents were willing to accept ₦100,000 naira and above as compensation for a climate change adaptive/mitigation response program. It was also revealed that only 37.5 % of the farmers practiced changing time of planting date as an adaptive and mitigation measure while 42.5 % indicated insufficient fund as their major problem in the study area. Therefore government, non-government organizations, industrialist, policy makers and so on should stimulate the needed assistance for crop farmers to adapt/mitigate to climate change in the study area.

Keywords: Climate change, Adaptive/mitigation, Crop farmers, Anambra state, Nigeria.

1. Introduction

Global climate change is one of the most significant environmental challenges threatening the earth surface. Agriculture is one of the sectors that are most vulnerable to shifts in climate (IPCC, 2007). Many African countries, which have their economies largely based on agricultural production like Nigeria, are particularly vulnerable to climate change. Dinar, Hassan, Kurukulasuriya, Benhin, & Mendelsohn, (2009); Dinar, Hassan, Kurukulasuriya, Benhin & Mendelsohn, (2006). This vulnerability has been demonstrated by the devastating effects of recent flooding in the south eastern region of the country and gully erosion that are

currently witnessed in some parts of Anambra State (NEST, 2010). Although, climate change may affect the agricultural sectors of different countries in different ways, it is clear that these changes will bring about substantial reduction in sources of livelihood.

Adaptation to climate change is defined as initiative and measures to reduce the vulnerability of natural and human systems to actual or potential climate change effects (IPCC, 2007) while mitigation to climate change involves actions that are designed to limit the amount of long term effect.(Fisher, 2007). It is widely agreed that there is a limit to attainment in adaptation and that mitigation measures must be undertaken simultaneously to prevent the negative impact of climate change on agricultural practices. Institute of Global Environmental Study (IGES, 2008). Adaptation and mitigation are the most efficient ways farmers reduce these negative impacts (Füssel, Klein, & Ebi, 2006). Farmers could achieve these through adaptive / mitigation actions or governments' implementation of policies aimed at promoting appropriate and effective adaptation/mitigation measures. Manifestations of the effects of climate change on the earth surface features and phenomena depend on many variables including climatic and soil conditions, farming system, the change itself, and the ability to cope depend on the available infrastructure and capacity of the individuals (Olesen & Bindi, 2002) According to IPCC (2007), the world will witness higher temperatures and changing precipitation levels by the year 2050. The effects of this temperature rise will lead to low agricultural productivity leading to declining production of such staple foods as cassava, cocoyam, yam and some other root crops and vegetables that are major crop produced by farmers.

Farmers that undertake adaptive and mitigation measures are influenced by their socioeconomic, environmental and institutional factors, as well as the economic structures of their country. Deressa *et al.* (2009) concluded that farmers' educational level, access to extension and credit, climate information, social capital and agro-ecological settings greatly influence choices, while financial constraints and lack of information hinder farmers' uptake of adaptation and mitigation options.

For some developing countries like Nigeria, that are highly vulnerable to climate variation , understanding farmers' responses to climatic change is crucial, as this will help in designing appropriate coping strategies in order to meet the increasing food and non-food needs of the population (Abrahamson, 1989; Ehrlich & Ehrlich, 1990). Anambra State in South eastern part of Nigeria, for example is highly vulnerable to climate change due to endemic poverty, fragile soil and weak institutions, Nigerian Environmental Study Team (NEST, 2004). Therefore, understanding farmers' willingness to accept adaptive and mitigation responses cannot be overemphasized as farmers will be encouraged to produce at a sustainable level. None or little has been done on crop farmer's willingness to accept adaptive and mitigation response in Anambra State. At this point, it becomes pertinent to state the specific objectives of the study as follows;

- (1) Describe farmers' socio economic characteristics;
- (2) Ascertain farmers' awareness of climate change in the study area;
- (3) Ascertain willingness to accept compensation for climate change adaptive/mitigation response programs in the study area by the farmers

- (4) Identify the various types of adaptive/mitigation activities farmers practice in the study area; and
- (5) Identify the constraints encountered by farmers in practicing adaptive/mitigation measures in the study area.

2. Materials and Methods

2.1 Description of the Study Area

The locations where data were collected are Alor, Nnobi, Oba and Ojoto, in Idemili-South Local Government Area of Anambra State, Nigeria. Idemili-South Local Government is one of the twenty one (21) Local Government Areas of Anambra State. It has its headquarters at Ojoto. It is made up of 7 communities which are Akwaukwu, Alor, Awka-Etiti, Nnobi, Nnokwa, Oba and Ojoto (Anambra State Government, 2007). Latitude 6^o 20'60 North and Longitude 7^o East. The four communities namely; Alor, Nnobi, Oba and Ojoto were purposively selected for the study, based on their farming activities. A sample size of 20 crop farmers were randomly selected from each of the 4 communities, making a total sample size of 80 crop farmers for the study.

3. Results and Discussion

3. 1. Socioeconomic Characteristics of Respondents in the Study Area

From table 1, below, majority (81.25%) of the respondents were male, while only (18.75%) were female. The age distribution depicts that majority (60%) of the crop farmers were within the age range of 46-55years, while their mean age is 58 years. The respondent's marital status showed that the majorities (62.5%) were married, 21.5% were widowed, and 12.5% single and only 3.75% were divorced. Distribution of farmers by educational qualification depicts that the majority (50%) of them had secondary education while 11.25% had no formal education. Deressa *et al.* (2009) conclude that farmers' education level greatly influence their choices of adaptation practices. The table further showed that the majority (72.5%) of the respondents had household sizes of 1-5 persons with 5 persons as average family size. Only 47.5% of the respondents had farming experience of 11years and above while 15% had 1-5years farming experience. This implies that most respondents have acquired reasonable years of farming experience in the study area.

Table 1: Distribution of the Farmers According to their Socio- Economic Characteristics (Field Survey, 2017)

Variable	Frequency	Percentage	Mean
Sex			
Male	65	81.25	
Female	15	18.75	
Age (Years)			
26 -35 years	6	7.5	
36 -45 years	10	12.5	
46 - 55 years	48	60.0	58
56 -65 years	12	15.0	
66 years and above	4	5.0	
Marital Status			
Single	10	12.5	
Married	50	62.5	
Divorced	3	3.75	
Widowed	17	21.25	
Total	80	100	
Education Level			
No Formal Education	9	11.25	
Primary Education	18	22.5	
Secondary Education	40	50.0	
Tertiary Education	13	16.25	
Total	80	100	
Households Size			
1 to 5 persons	58	72.5	
6 to 11 persons	20	25.0	
11 and above	2	2.5	5
Total	80	100	
Farming Experience			
1 to 5 years	12	15	
6 to 11 years	30	37.5	
11 and above	38	47.5	10
Total	80	100	
Religion			
Christianity	56	70.0	
Muslim	1	1.25	
Traditional / Idol worshippers	20	25.0	
Others	3	3.75	
Housing Characteristics			
Upstairs	18	22.5	
Bungalows	56	70.0	
Thatched house	2	2.5	
Mud house	3	3.75	
Wood house	1	1.25	
Total	80	100	

3.2. Awareness of Climate Change

Table 2, below shows that the majority (60 %) of the were aware of climate change. The mean score of 3.48 also asserts respondents very high level awareness about climate change in the study area. The awareness of climate problems and the potential benefits of taking action is an important determinant of adoption of agricultural technologies (FAO, 2000). Maddison, (2006), also argued that farmer’s awareness of change in climate is important to adaptation decision making.

Table 2: Distribution of Crop Farmers According to Awareness to Climate Change (Field Survey, 2017)

Awareness	Frequency	Percentages
Very Low Level	5	6.25
Low Level	7	8.75
High Level	20	25.0
Very High Level	48	60.0
Total	80	100

Respondent’s willingness to accept compensation to practice climate change adaptive/mitigation response programs in the study area.

Table 3 below shows that the majority (55%) of the respondents were willing-to-accept ₦100,000 naira and above as shown in for an adaptive/mitigation response program. This implies that, respondent’s willingness-to-accept adaptive /mitigation response program increase as fund made readily available to them increases.

Table 3: Distribution of Respondent’s Willingness-To-Accept Compensation to Practice Climate Change Adaptive/Mitigation Response Programs in the Study Area (Field Survey, 2017)

Amount in naira (₦) respondents are willing-to-accept for a climate change adaptive/mitigation response program.	Frequency	Percentages
100,000	44	55
80,000	18	22.5
60,000	10	12.5
40,000	6	7.5
20,000	2	2.5
Total	80	100

3.3. Types of Adaptive/Mitigation Measures Practiced by Respondents in the Study Area.

Table 4 below revealed that only 29.41 % of the respondents practiced changing time of planting date while 14.7 % involved in the use of early crop maturing varieties. About 9.80 % respondents used crop rotation as a crop management practice to adapt/mitigate to climate change. Mulching during dry season was practiced by 3.92 % of the respondents. Downing,

Ringius, Hulme & Waughray (1997) reported that increasing the use of organic matters such as mulch could prevent excessive soil moisture loss, increase soil aeration and soil moisture holding capacity. However, 0.98 % of the respondents utilized planting of crop with early rainfall and use of credit facilities respectively as an adaptive/mitigation measure. The reason being that it is not a common adaptive/mitigation measure in the study area. The credit facilities could assist farmers construct irrigation channels in order to avert flooding and provide moisture for the crops.

Table 4: Distribution of Respondents According to the Types of Adaptive/Mitigation Measures Practiced in the Study Area. (Field Survey, 2017)

Adaptive/mitigation strategies	Frequency	Percentages
Planting of crop with early rainfall	1	0.98
Use of early crop maturing varieties	15	14.7
Contour construction	2	1.96
Planting of vetiver grass	3	2.94
Mulching during dry season	4	3.92
Shifting cultivation	3	2.94
Diversification	8	7.84
Changing time of planting date	30	29.41
Changing time of land preparation	3	2.94
Changing time of harvest for good storage	4	3.92
Planting different varieties	9	8.82
Afforestation programs	5	4.90
Use of indigenous knowledge	2	1.96
Use of credit facilities	1	0.98
Increased use of irrigation/ground water system	2	1.98
Crop rotation	10	9.80
Total	102	100

Multiple responses recorded

3.4. Constraints Encountered by Crop Farmers in the Study Area.

Table 5 shows that 17.43 % of the respondents indicated insufficient funds as their major problem. This finding supports Enete & Onyekuru, (2011) who asserted that the acquisition of necessary facilities needed to adapt/mitigate to climate change problems will be difficult with limited funds. Deressa *et al.* (2009) also argued that financial constraints hinder farmers' uptake of other adaptation methods. This underscores the problems of insufficient fund and suggests the need to improve the availability of funds to them. Also, 6.15 % of the respondents complained about seasonal variation factor being a constraint. Lack of planting materials was a challenge experienced by 5.64 % of the respondents whereas only 5.12 % complained about insufficient irrigation system. Furthermore, the findings showed that weeds, pest and disease infections recorded 5.12 %, while inadequate knowledge on

adaptation/mitigation measures was 4.10 % and only 1.02 % indicated lack of security and Scarcity of labor as a constraint in the study area.

Table 5: Distribution of Respondents According to Constraints Encountered in the Practice of Adaptation and Mitigation Programs in the Study Area. (Field Survey; 2017)

Constraints	Frequency	Percentages
Non availability of land	9	4.61
Insufficient fund	34	17.43
Seasonal variation factor	12	6.15
Insufficient irrigation system	10	5.12
Lack of planting materials	11	5.64
Lack of extension contact	5	2.56
Cultural bias	3	1.53
Low institutional capacity at government level.	18	9.23
Lack of security	2	1.02
Weeds/pest/disease infections	10	5.12
Inadequate knowledge on adaptation/mitigation measures.	8	4.10
Scarcity of labor	2	1.02
Lack of government incentive	18	9.23
Low level of awareness	3	1.53
Lack of storage facilities.	16	8.20
Lack of technology for value addition	19	9.74
Lack of energy supply	15	7.69
Total	195	100

Multiple responses recorded

4. Conclusion

The present study has shown that respondents have very high level awareness about climate change problems and are willing to accept climate change adaptive/mitigation response programs if they are motivated through cash because adaptation/mitigation practices are expensive. It was also witnessed that respondents practiced changing time of planting date as their major adaptive/mitigation strategies. Also, majority of crop farmers in the study area practiced changing time of planting date as their major adaptation and mitigation response strategies and encountered insufficient funds to practice adaptation and mitigation response programs in the study area.

Acknowledgments

The authors are indeed very grateful to crop farmers association in Idemili South Local Government Area of Anambra State for their cooperation and permission that facilitated data collection for this study.

References

Abrahamson, D. (Ed.). (1989). The challenge of global warming. Washington, D.C.: Island Press. Climate Change in Zenzelima, Ethiopia. , 11-13.

- Deressa, T.T., Hassan, R.M., & Ringler, C. (2011). Perception of and adaptation to climate change by farmers in the Nile Basin of Ethiopia. *Journal of Agricultural Science*, (149), 23-31.
- Deressa, T.T., Hassan, R.M., Ringler, C., Tekie, A., & Mahmud, Y. (2009). Determinants of farmers' choice of adaptation methods to climate change in the Nile Basin of Ethiopia. *Global Environmental Change*, (19), 248- 255.
- Dinar, A., Hassan, R., Kurukulasuriya, P., Benhin, J. & Mendelsohn, R. (2006). The policy nexus between agriculture and climate change in Africa. A synthesis of the investigation under the GEF/WB Project: Regional climate, water and agriculture: Impacts on and adaptation of agro-ecological systems in Africa. CEEPA, 39.
- Downing, T. E., Ringius, L., Hulme, M. & Waughray, D. (1997). Adapting to climate change in Africa. *Mitigation Adaptation Strategies Global Change*, (2), 19-44.
- Ehrlich, P. R. & Ehrlich, A. H. (1990). How the rich can save the poor and themselves: lessons from the global warming In *Global warming and climate change: perspectives from developing countries*. New Delhi: Tata Energy Research Institute.
- Enete, A. A. & Onyekuru, A. N. (2011). Challenges of agricultural adaptation to climate change: Empirical Evidence from Southeast Nigeria.
- Fisher, B.S. (2007). Issues related to mitigation in the long-term context. Climate change 2007: Mitigation contribution of working group III to the fourth assessment report of the intergovernmental panel on climate change. B. Metz, O. Davidson, P. Bosch, R. Dave and L. Meyer, Eds., *Cambridge University Press*, Cambridge, UK.
- Food and Agricultural Organization. (F..A.O), (2000). Two essays on climate change and agriculture. A developing country perspective.
- Füssel, H. M., Klein, R. J. T. & Ebi, K. L. (2006). Adaptation assessment for public health: In Menne, B. and Ebi, K. L. (eds.), *Climate change and adaptation strategies for human health*, SteinkopffVerlag, Darmstadt, 41–62.
- Institute of Global Environmental Study (IGES), 2008. Climate policy project and Ancha, Srinivasan, (eds.): *The climate regime beyond 2012: Reconciling Asian Developmental Priorities and Global Climate Interests*. Hayama, Japan.
- Inter-Governmental Panel for Climate Change. (2007). *Climate Change: Impacts, Adaptation and Vulnerability*. In: Parry M.L., Canziani O.F., Palutikof J.P., van der Linder P.J., Hanson C.E. (eds.), *Contribution of working group II to the IPCC fourth assessment report*. Cambridge, UK: Cambridge University Press.
- Maddison, D. (2006). The perception of and adaptation to climate change in Africa, CEEPA Discussion Paper No.10. Centre for Environmental Economics and Policy in Africa. Pretoria, South Africa: University Press of Pretoria.
- Nigerian Environmental Study Team. (2004). Regional climate modelling and climate scenarios development in support of vulnerability and adaptation studies: Outcome of regional climate modeling efforts over Nigeria. Ibadan, Nigeria.
- Olesen, J. & Bindi, M. (2002). Consequences of climate change for European agricultural productivity, land use and policy. *European Journal of Agronomy*, 16(4), 239-262.