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Sources of Awareness and Perception of the Effects of Climate Change among Sesame Producers in the Southern Agricultural Zone of Nasarawa State, Nigeria

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Abstract

The study was conducted to determine the sources of awareness of climate change and ascertain the perception of the effects among sesame producers in the Southern Agricultural Zone of Nasarawa State, Nigeria. A multistage random sampling technique was used in selecting 180 sesame farmers that participated in the study. Descriptive statistics were used in analyzing data. Major results show that both males and females mostly (40%) between the ages of 31-40 years were involved in sesame production. The level of education was low. Increased rains, insect infestation and torrential downpours were perceived as effects of climate change. Sesame farmers' had adapted to such changes through the use of chemicals, insect powders, early planting and early harvesting. Results also show that extension agents, radio and television were the major sources of awareness of the effects of climate change. The study concluded with the recommendation that farmers' awareness of the devastating effects of climate change is very critical for helping them adapt to climate change and need to be urgently strengthened by extension service so as to sustain sesame production even in the event of climate change.

Keywords: Sources of Awareness, Perception, Climate Change, Sesame, Nasarawa state

Introduction

Sesame (*sesamum indicum*) belongs to the plant family *Pedaliacea* commonly called beniseed in Nigeria. It is an important oilseed crop believed to have originated from tropical Africa, where there is the greatest genetic diversity. It was later taken at a very early date to India where a secondary centre of diversity was developed (Purseglove, 1969). Oplinger *et al* (1990) indicated it to be a highly prized oilseed crop in Babylon and Assyria about 4,000 years ago.

In Nigeria, sesame is cultivated on over 80,000 ha across most of the Northern States for food and oil. Benue and Nasarawa States are the highest sesame producers in Nigeria with an annual average output of not less than 40,000MT (Raw Materials Research and Development Council, 2004). Although the name sesame is used in literature worldwide and also known as “simsim” in East Africa, “Till” in India and “Gingely” in Sri-Lanka, the Hausa, Ibo, and Yoruba, major tribes of Nigeria call it “Ridi”, “Ekuku” and “Isasa,” respectively. Other tribes in Nigeria also have names for it.

As a raw export commodity, sesame seed from Nigeria is enjoying a rising profile in the world market where overall global demand has risen to 3.3 million tons. Sesame is one of the major cash crops grown in Nasarawa State. It is a very popular crop among the rural farmers because of the good local and international markets for its seed and oil. There are already buyers from China and other parts of the Asian countries that patronize the product (Nasarawa State Government, 2008). The Southern agricultural zone is the major producer of sesame in Nasarawa state.

The impacts of global climate change on agricultural production are a serious source of worry to farmers in sub-saharan Africa. This is because their economies mainly depend on agriculture which is now affected by climate change catastrophes. Farmers’ awareness and perception of these changes is therefore critical and of concern in Nigeria, particularly among sesame farmers in the study area where vulnerability is high because awareness and the ability to adapt are low.

The study’s specific objectives were to determine farmers’ perception of the effects of climate change; identify the perceived suitable adaptive measures employed by respondents; and identify sources of awareness of adaptive measures used to cope with the effects of climate change.

Methodology

Nasarawa State has thirteen local government areas (LGAs) and is divided into three agricultural zones namely: Central, Western and Southern agricultural zones respectively. The study was conducted in the Southern Agricultural Zone which comprises Lafia, Doma, Keana, Awe and Obi Local Government Areas (LGAs). The zone is characterized by long period of rainy season (March-October). The average annual rainfall is approximately 107.3mm and annual temperature ranging from 22.7°C-36.8°C (Meteorological department, NSG, 2008). The major tribes are Alago, Eggon, Kanuri, Migili, and Gwandara. Others include Tiv, Hausa – Fulani, Igbo, Yoruba and Ngas. Most of the people are farmers who engage in trading and artisan work as part time commercial activities.

Sesame farmers in the zone constituted the population for the study. A multistage random sampling technique was used to select respondents. Two town communities were randomly selected from each of the five LGAs to give a total of ten town communities. They include Deddere and Olosoho (Obi), Amaku and Idadu (Doma), Kwandare and Shabu (Lafia), Ribí and Wuse (Awe) and (Keana). Eighteen sesame farmers with long years of farm experience were purposively selected from each of the town community. The preference for farmers with long years of farm experience was made so as to gain the most useful information from them on their experiences of changes in climate as it affects their farming practices and production. This gave a sample size of 180.

In order to characterize the respondents, issues on their socio economic characteristics such as age, marital status, farming experience, sex, educational level, membership of social organization, annual income and yield were ascertained. In identifying farmers perception of the effects of climate change, in depth literature reviews, expert opinions and observations were utilized in framing the questions used. Farmers were asked to tick options that apply to their perceptions of the effects of climate change and their sources of awareness. Simple descriptive statistics such as percentages, means and frequencies were used in analyzing data.

Results

Socio-economic Characteristic of Sesame Farmers in the Study Area

The socio-economic characteristics of the respondents are presented in Table 1. The result reveals that 40% and 37.8% of the respondents were within active ages of 20-30 and 31- 40 years, respectively. This result agrees with the findings of Yusuf (2005) that most farmers are within their active years and can make positive contribution to agricultural production. Some studies have found that age had no influence on farmers' decision to participate in forest and soil and water management activities (Thatcher et al., 1997; Anim, 1999; Zhang and Flick, 2001; Bekele and Drake, 2003). Others, however, found that age is significantly and negatively related to farmers' decision to adopt (Gould et al., 1989; Featherstone and Godwin, 1993). However, Okeye (1998) and Bayard et al. (2007) found that age is positively related to the adoption of conservation measures. In this study, we assumed that old age is associated with more experience and expect older farmers to have better understanding of the effects and adapt to climate changes. However we also expect young people to have a longer planning horizon to take up long adaptations measures such as irrigation and mixed crop livestock systems.

Analysis of gender in sesame production indicated that men comprised 53.3 percent whereas female comprised 47.7 percent. The result implies both males and females are involved in sesame production. These results disagree with the findings of Umar et al. (2011) who reported high male dominance in sesame

production in the study area. The result also shows that 63.3 percent of the respondents were married. The high proportion of the respondents who are married is an indication that family labour could be available for sesame farmers.

The distribution of respondents according to educational level is in Table 1. It shows that majority (34.4%) of the respondents had secondary education, 26.7 percent had non- formal education whereas 16.7 and 22.2 percent had primary and tertiary education respectively. This implies that most of the respondents were not well educated. Noor (1981) and Omolola (2005) documented the relevance of the literacy level of a farmer to farm productivity and production efficiency. They are of the view that education facilitates farmers' understanding and use of improved crop technologies. Furthermore, farmers' experience in sesame production had majority (58.9%) of the farmers with less than 3 years farming experience, whereas 40 percent of the respondent had 3- 6 years farming experience. Table 2 shows that 46.7 percent of the respondents earned below ₦50,000 per annum whereas 37.8 percent earned ₦50000-~~₦100000~~ per annum. Those with higher annual income level of above ₦150,000 were only 4.4 percent of the respondents.

TABLE 1
Distribution of respondents according to their socioeconomic characteristics

Variables		Frequency	Percentage
Age(yrs)	20-30	72	40
	31-40	68	37.8
	41-50	30	16.7
	Above 50	10	5.6
	Total	180	100
Sex	Male	96	53.3
	Female	84	46.7
	Total	180	100
Marital status	Married	114	63.3
	Single	66	36.7
	Total	180	100
Educational level	Non formal	48	26.7
	Primary	30	16.7
	Secondary	62	34.4
	Tertiary	40	22.2
	Total	180	100
Farming experience(yrs)	<3	106	58.9
	3-6	72	40
	6-9	2	1.1
	Total	180	100
Yield (bags)	<3	76	42.2
	3-6	80	44.4
	7-10	24	13.3
	Total	180	100
Annual income (Naira)	<50000	84	46.7
	50001-100000	68	37.8
	100001-150000	20	11.1
	>150000	8	4.4
	Total	180	100
Social organization	Non member	100	73.3
	Member	80	27.7
	Total	180	100

Source: Field survey

Farmer perceptions of the effects of climate change in the study area

Results in Table 2 show that majority of the respondents' perceived increase in rains (73.3%), insects' infestation (68.9), torrential downpours (73.3%), temperature changes (70.0%) and soil erosion (76.7%) as resulting from the effects of changes in climate in the area. This contradicts the study on Tologbonse et al., (2010) on farmers perception of climate change where they found that farmers perceived increase in temperature as being the highest effect of climate change however, the study agrees that climate change increases flooding which results in soil erosion, thus degrading soil fertility and quality which invariably reduces agricultural productivity. On the other hand, 26.7% and 48.9% of the respondents perceived draught and dry spells and increase in evaporation of soil moisture respectively to be caused by climate change in the area.

TABLE 2
Distribution of respondents according to their perception of the effects of climate change

Effects of climate change	*Frequency	Percentage
Draught and dry spells	48	26.7
Increase rains	132	73.3
Increase evaporation of soil moisture	88	48.9
Insects infestation	124	68.9
Torrential downpours	132	73.3
Temperature changes	126	70
Soil erosion	138	76.7

Source: Field survey

**Multiple responses are considered*

Perceived adaptation strategies of sesame farmers

The results (Table 3) show that use of insect's powder, use of chemicals, early harvesting and early planting had over 50% of the respondents agreeing that they perceived this practices to be the suitable practices they adopted as adaptive measures to cope with the effects of climate change. Whereas, mixed cropping, improved seed variety and increase soil water conservation had 41%, 47.8% and 33.3% respectively of the respondents who opted for them as suitable adaptive measures to cope with the effects of climate change.

TABLE 3
Distribution of respondents according to the adaptive measures adopted

Adaptive measures	*Frequency	Percentage
Mixed cropping	74	41.1
Improved seed variety	86	47.8
Early planting	98	54.4
Early harvesting	102	56.7
Use of chemicals	104	57.8
Increase soil water conservation	60	33.3
Use of insects powder	114	63.3

Source: Field survey

**Multiple responses are considered*

Sources of awareness

Results in Table 3 show extension agents (76.7%), educated farmers (83.3%) and radio and television (61.1%) had majority of the respondents agreeing that they are their sources of awareness of effects of climate change and the adaptive measures to cope with such changes. Whereas, 52.2%, 28.9% and 18.9% of the respondents identified friends (Non farmers), nongovernmental organizations and newspapers as their sources of awareness of the effects and adaptive measures to cope with the effects of climate change respectively.

Awareness of the effects of climate changes through appropriate and reliable sources is an important determinant of adoption of suitable adaptive measures to cope with such changes. Maddison (2007) found that farmers' awareness of changes in climate attributes is important for adaptations decision making. Several studies have found that farmer's awareness and perceptions of soil erosion problems positively and significantly affected their decisions to adopt suitable adaptation measures (Gould et al., 1989; Traore et al., 1998; Anim, 1999; Aray & Adjaye, 2001). It is expected that farmers who notice and are aware of changes in climate would take up adaptation measures that help them reduce losses or take advantage of the opportunities associated with these changes.

TABLE 4
Distribution of respondents according to their sources of awareness of the effects of climate change and their adaptive measures

Sources of Awareness	*Frequency	Percentage
Extension agents	138	76.7
Educated farmers	150	83.3
Newspapers	34	18.9
Friends (Non farmers)	94	52.2
Non-Governmental organizations	52	28.9
Radio and Television	110	61.1

Source: Field survey

**Multiple responses are considered*

Conclusion

The results of this study revealed that majority of the respondents were still within their active ages of between 20-30 and 31-40 years respectively. Sesame production in southern agricultural zone of Nasarawa State is both male and female dominated enterprise. It was revealed that majority (34.4%) of the respondents had secondary education, 26.7 percent had non- formal education whereas 16.7 and 22.2 percent had primary and tertiary education respectively. The results show that Use of insect's powder, Use of chemicals, Early harvesting and Early planting had over 50% of the respondents agreeing that they perceived this practices to be the suitable practices they adopted as adaptive measures to cope with the effects of climate changes. It was also revealed that extension agents (76.7%), educated farmers (83.3%) and radio and television (61.1%) had majority of the respondents agreeing that they are their sources of awareness of effects of climate changes and the adaptive measures to cope with such changes. Others identified friends (Non farmers), nongovernmental organizations and newspapers as their sources of awareness of the effects and adaptive measures to cope with the effects of climate change.

Recommendations

In view of the findings in this study, the paper recommends that agricultural extension service should play a crucial role of informing its clientele (farmers) on how best to adapt to climate change impacts. This will require some further training on the part of the extension personnel in order to build their own capacity to effectively strengthen farmers' capacities. Researchers and extensionists must as a matter of urgency work closely with sesame farmers to create awareness on the effects of climate changes as it affects their farming activities. They must also strengthen the confidence of farmers by expressing faith in such adaptive measures for a sustainable agricultural development

Effective education and training to build and strengthen the capacity of farmers is needed since the study revealed that farmers' have low educational qualifications. This will enable farmers and people in the area to respond proactively to the impacts of climate change and climate variability and understand the scientific principle at work in their environment and also stimulate them to know better adaptive strategies to climate change. Therefore, government and non-governmental organizations should design effective adult literacy programmes and policies in the area which will encourage farmers to improve on their educational levels.

References

- Anim, F.D.K (1999). The adoption of soil conservation measures in the Northern Province of South Africa. *Journal of Agricultural Economics* 50, 336-45.
- Araya, B. and Adjaye, J. A. (2001). Adoption of farm level soil Conservation practices in Eritrea. *Indian Journal of Agricultural Economics* 56, 239-52.
- Bayard, B., Jolly, C. M. and Shannon, D. A. (2007). The economics of adoption and management of alley cropping in Haiti. *Journal of Environmental Management*. 84, 62-70.
- Bekele, W. and Drake, L. (2003). Soil and water conservation decision behavior of subsistence farmers in the Eastern Highlands of Ethiopia: A case study of the Hunde-Lafto Area. *Ecological Economics* 46, 437-51.
- Featherstone, A. M. and Godwin, B. K. (1993). Factors influencing a farmer's decision to invest in long-term conservation improvements. *Land Economics* 69, 67- 81.
- Gould, B. W., Saupe, W. E. and Klemme, R. M. (1989). Conservation tillage: The role of farm and operator characteristics and the perception of soil erosion. *Land Economics* 65, 167-82.
- Maddison, D. (2006). *The perception of and adaptation to climate in Africa*. CEEPA Discussion paper No.10. Centre for Environmental Economics and Policy in Africa, University of Pretoria.
- Nasarawa State Government. (2006). Ministry of Information, Lafia Annual Report.
- Noor, A. (1981). Educational and Basic Human Needs. World Bank Working Paper No. 450.
- Okoye, C. U. (1998). Comparative analysis of factors in the adoption of traditional and recommended soil erosion control practices in Nigeria. *Soil and Tillage Research* 45, 251-63.

- Omolola, A. S. (2005). Agribusiness credit in Nigeria: Dimensions of Institutional and Policy Deficiency. A paper presented at the third National Conference of ARMTH in Ilorin. In: G.C Onubogu and B.C Nnadozie (Eds): *Agricultural Rebirth in Nigeria. Proceedings of the 39th Annual Conference of the Agricultural Society of Nigeria*. University of Benin, Nigeria, Pp44-49.
- Oplinger, E.S., Putnam, D.H., Kaminski, A.R., Hanson, C.V., Oelke, E.A., Schulte, E.E. and Doll, J.D. (2007). *Alternative Field Crops Manual: Sesame*. Retrieved from <http://www.hort.purdue.edu/newcrop/afcm/sesame.html>.
- Purseglove, J.W. (1996). *Tropical Crops*. Longman, London, 435pp.
- Thacher, T., Lee D. R. and Schelhas, J. W. (1997). Farmer participation in reforestation incentives programmes in Costa Rica. *Agro-forestry Systems* 35 (3), 269-89.
- Tologbonse, E.B., Auta S.J., Bidoli, T.D., Jaliya, M.M., Onu, R.O. And Isa, F.O. (2010). Farmers perception of the effects of climate change and coping strategies in three agro-ecological zones of Nigeria. *Journal of Agricultural Extension*. 14 (1), 144 -156
- Traore, N, Landry, R. and Amara, N. (1998). On-farm adoption of conservation practices: The role of farm and farmer characteristics, perceptions and health hazards. *Land Economics* 74, 114-27.
- Umar, H. S., Okoye, C. U. and Agwale A. O. (2011) Productivity analysis of sesame production under organic and inorganic fertilizers applications in Doma Local Government Area, Nasarawa State, Nigeria. *Tropical and Subtropical Agroecosystems* 14 (1), 405-411
- Yusuf, O. (2005). Economics analysis of 'egusi' melon production in Okehi Local Government Area of Kogi State, unpublished M.Sc. Thesis, Department of Agricultural Economics and Rural Sociology, Ahmadu Bello University, Zaria, Pp. 40-41.
- Zhang, D. and Flick, W. (2001). Sticks, carrots and reforestation investments. *Land Economics* 77 (3), 443-56.