Influence of Agricultural Extension Contact on Control of Farmland Degradation among Yam Farmers in Delta North Agricultural Zone of Delta State, Nigeria

B. O. Ovwigho

Department of Agricultural Economics and Extension Delta State University, Asaba Campus, Asaba, Delta State, Nigeria
bishopvwigho@yahoo.com

Doi:10.5901/mjss.2014.v5n2p33

Abstract

The main objective of the study was to investigate the influence of extension contact on control of farm land degradation among yam farmers. Eight rural communities were randomly selected for the study. From the eight communities one hundred and twenty (120) yam farmers were randomly drawn to compose the sample. Data were collected by use of structured interview schedule and analysed by mean, Chi square test and Pearson r. It was found that majority of the farmers were old (M =47.77) and below secondary education (M = 9.41). The mean number of extension contact had by the farmers was 3.93. The yam farmers agreed that land degradation could cause famine (M= 2.78), low yam yield (M= 2.71), low quality of yam (M= 3.14), and tussle and pressure on available land M= 2.51). There was a positive and significant relationship between extension contact and perception of the effects of farm land degradation on yam production (r = 0.87). There were significant relationships between number of extension contacts, and mulching (X2 =60.25, r= 0.71); organic manure application (X2 = 55.03, r = 0.68); and avoidance of bush burning (X2 = 86.40, r = 0.85). There was no significant relationship between extension contacts and terracing (X2 =15.95, r= 0.37). The study established that education campaign I the control of farm land degradation through avoidance of bush burning, use of mulching and organic manure. The education campaigns to control farm land degradation was effective in the study area.

Keywords: *Yam, extension contact, land degradation control measures, perception*

1. Introduction

1.1 Background Information

In the world over, land is the most important factor of crop production. The economic importance of land makes farmers to treasure, maintain and guard the land jealously as a means of social and economic survival. Sometimes the farmers' effort to protect the land is thwarted by land degradation occasioned by vagaries of human and environmental factors. Land degradation is a global malaise which could precipitate unprecedented disaster to man, animals, food and the environment. Barrow (1991) and Beinroth *et. al* (1994) defined land degradation as a decline in land quality caused by human activities and natural occurrences. It is the loss of actual or potential productivity of the land due to anthropogenic factors. Land degradation was actually a mismatch between land quality and land use. They opined that high population density was not necessarily the cause of land degradation but what the population does to the land determines the extent of degradation. Similarly, World Bank (2007) defined land degradation as a reduction of resource potential, loss of utility or potential utility resulting in temporary or permanent lowering of current or future productive capacity of land by natural or human processes that act on the land such as water erosion, wind erosion, reduction in natural vegetation, salinization or solidification.

Asadu, Ezeaku and Nnaji (2004) posited that Land degradation could be grouped into soil erosion, soil fertility and soil pollution by oil spillage and industrial waste. According to FAO (2002) and Anande-Kur (1992) the limits of land to produce were set by the soil, climatic conditions, available water resources and land use. Utilization of land beyond these limits result in degradation with decreasing productivity. Land degradation lowered the current or potential capability of soils to produce goods and services.

Land degradation could precipitate food scarcity and hunger in countries prone to perennial vagaries of land degradation. Scherr and Yadav (1996) found that land degradation had serious negative consequence on food security. Foth (1978) observed that man's use of the land for agriculture, grazing and urbanization have produced extensive

changes in soils. These changes are precipitated by erosion, earth moving, drainage, salinity, depletion and addition of organic matter, flooding and nutrient composition. These corroborate the fact that the urban environments were more prone to land pollution, blockage of drainages and flooding.

The causes of land degradation are numerous and vary within the farmer environment. Igwe. Akamigbo and Mbagwu (1995), and Lal (1995) noted that about 85% of the causes of land degradation worldwide were due to water and wind erosion. Rainfall was the major determinant of areas prone to risk of land degradation and desertification. Rainfall played a crucial role in plant life but the variability and extremes of it often led to erosion, nutrient leaching, acidity, flooding and water logging. They emphasized that the land was prominently derelict by the action of gully erosion due to high rate of run-off from the adjacent hills. Land degradation has often led to low productivity and yield.

Kuypers, Mollema and Topper (2005) noted that every minute, an estimated 10 hectares of agricultural land was lost to erosion throughout the world. In some areas, very little occurs while in others more than 200 tons of soil disappears every year from 1 hectare of land. This was equivalent to 20 lorry loads of soil. On average about 50 tons of soil per hectare were lost each year. The soil lost was the top layer, which was the most fertile part of the soil. They noted that there were two types of erosion- natural and accelerated erosion, (man-made erosion).

- Natural erosion went on all the time. These included weathering of mountains, hills and rocks by the influences of nature.
- Man-made erosion occurred when people caused the soil to become susceptible to be carried away by rain or wind. Cutting trees and burning vegetation were examples of practices that destroyed the natural protection of the soil.

Akinnagba and Umukoro (2011), and Rosegrant and Ringler (1997) noted that land degradation was the most serious problem affecting agricultural production in developing countries. They agreed that the high incidence of land degradation constitute a significant cost on agricultural production. Reich, Numben, Almara and Eswaran (2011) stated that land degradation has caused progressive decrease in the performance of the land. They maintained that where populations were low shifting cultivation and transhumance pastorals were able to circumvent declining productivity. They noted that with the increasing population these practices were no longer possible.

Land degradation has caused woes to farm families. Agricultural extension and education when properly directed could be used to predict and advise the farmer on control measures to reduce land degradation. CTA (2011) and USAID (2011) maintained that extension and advisory services were designed to help farmers boost crops and livestock production. These services enable farmers to adopt new technologies for increase production and profitability. According to them the specific objectives of agricultural extension and advisory services were to :

i. provide advice to farmers on problems or opportunities in agricultural production, marketing, conservation and family livelihood;
ii. facilitate development of local skills and organisations, and to serve as links with other programmes and institutions;
iii. transfer new technologies to farmers and rural people; and
iv. address public interest issues in rural areas, resource conservation, health and food security, monitoring agricultural production,, monitoring food safety, nutrition and family education as well as youth development.

Swanson (2008) stated that the term agricultural extension was no longer restricted to the emphasis on technology transfer reflected by the Training and Visit System but has moved towards broader concepts which included developing the skills and management capacities of farming families. Many factors consternate the small scale farmers in a bid to enhance their standard of living through increased food production. Agricultural extension is basically designed to remove obstacles to increase food production among farm families. Land degradation is a global malaise and has remained a major obstacle to increased food production. The study is a follow-up of the state government initiative to forestall the future devastation of agricultural land following the 2011 and 2012 flood disaster. Apart from cash donations by international development agencies extension workers were also mobilized to educate farmers on the control of farm land degradation. Thus the main objective of the study was to investigate the influence of extension contacts on control measures against farm land degradation among yam farmers in the study area. The specific objectives of the study were to:

i. describe the demographic characteristics of the yam farmers;
ii. ascertain the number of extension contacts in 2011 and 2012;
iii. examine the yam farmers' perception of the effects of farm land degradation on yam production;
iv. find the relationship between agricultural extension contacts and perception of effects of farm land degradation on yam production; and

v. explore the relationships between number of extension contacts and control measures adopted against farm land degradation.

2. Materials and Methods

2.1 Description of the Study Area

The study was conducted in Delta North Agricultural Zone of Delta State, Nigeria. Delta north is made up of ten Local Government Areas. The traditional occupation of the people is farming. Yam production has the highest comparative advantage over other crops produced in the zone hence ir was selected for the study. The land was highly degraded by flood and gully erosion in 2011 and 2012 rains to the extent that many of the farmers evacuated their farms

2.2 Sampling Technique and Sample Size

The study was a survey research design. Eight rural communities were randomly selected.. The sampling frame of the yam farmers was eight hundred and one (801). Fifteen percent of the farmers which corresponded to one hundred and twenty (120) were randomly selected. Thus the sample size was 120 yam farmers.

2.3 Measurement of Variables

Demographic characteristics were measured by close ended and open ended questions. Farmers were made to supply their true ages. Level of education was measured by the number of years the farmer has spent under formal education. No formal education was scored zero while a person who spent 6 years in primary School was scored 6. Farm size was measured using the number of farm plots (100 ft x 50 ft) owned by the farmer. Household size included the parents, children and number of relatives living in one household. Frequency of extension contact was measured by the number of times the farmer was visited by extension agent and the number of times the farmer visited extension agent in the year 2011 and 2012 to solve problems related to land degradation. Control against land degradation was measured by dichotomous yes (1) and no (2) responses for mulching, terracing, organic manure application and avoidance of bush burning.. Perception of effects of land degradation on yam production was measured by the use of a four points Likert type rating scale. A mean cut- off point of 2.50 was used to dichotomize the responses into agree and disagree

2.4 Method of Data Collection and Analysis

Data were collected by use of interview schedule. The interview schedule measured demographic characteristics of the yam farmers; frequency of extension contact; yam farmers' perception of the effects of farm land degradation on yam production; and control measures adopted against farm land degradation. Data were analysed by descriptive statistics, Chi square test and Pearson r.

3. Results and Discussion

3.1 Demographic Characteristics of Respondents

The demographic characteristics examined were age, level of education, farming experience, farm size and household size. The results are presented in Table 1. Table 1 showed that the mean age of the farmers was approximately 48 years. This meant that the yam farmers consisted mostly of old people based on the religious-African definition of youth and adulthood by Ovwigho and Ifie (2009). The mean level of formal education was below secondary School (M = 9.41). This implied that the number of years spent by majority of the respondents in formal education settings was below 12 years being the minimum number of years required to attain secondary education. The results of the other demographic variables measured were farming experience (M = 7.05 years), household size (M = 4. .55) and farm size (M = 8.74 plots).

3.2 Agricultural Extension Contact

The numbers of extension contacts on land degradation campaignss made by the extension agent or the farmer to extension agent in 2011 and 2012 were collated and analysed (Table 2). Table 2 showed that the mean number of extension contacts had by the farmers was 3.93, approximately 4 times within the last two years. This meant that number of extension contact was generally low in the study area. This was in spite of the fact that the extension workers were specially mobilized to perform the education campaign. The ratio of 1:600 extension agents to farmers as identified by Ekpere (1990) has continued to plummet over the years in spite of high number of unemployed agricultural science University graduates. Ovwigho (2012), Agbamu (2005), and Ogunfiditimi and Ewuola (1995) maintained that the problems of agricultural extension in developing countries included lack of trained personnel, and financial support for extension activities, poor monitoring and evaluation, poor research and extension linkage, as well as poor planning, implementation and management.

3.3 Perception of Effects of Farm Land Degradation on Yam Production

The farmers' perception of the effects of farm land degradation on yam production was measured using five variables on a four-points Likert type scale (Table 3).

In Table 3, the yam farmers agreed that land degradation could cause famine (M= 2.78), low yam yield (M= 2.71), low quality of yam (M= 3.14), and tussle and pressure on available land M= 2.51). However, they disagreed with the statement that land degradation could reduce the social life of yam farmers (M=2.48). It could be inferred that most of the farmers did not realize the effects of mental depression occasioned by degraded farm land on the entire life of the farmer including his social outing. Many rural farmers appear to be non chalant about the effects of land degradation on yam production. Even where a farmer might be aware of his degrading land the costs of acquiring land amendment might restrict him to the degraded land. Kuypers, Mollema and Topper (2005) admonished that we should always keep the cause of the erosion process in mind when looking for signs of erosion in the field. When a change seemingly related to degradation was noticed on the land, one should ask oneself just why it should occur in that particular place and why it has that appearance. Land degradation apparently affects the present and future life of the farmer.

3.4 Relationship between Extension Contacts and Perception of Effects of Farm Land Degradation

The relationship between extension contact and total perception score of the effects of farm land degradation on yam production was analysed and presented in Table 4. An r value (0.87) showed that there was a positive and significant relationship between extension contact and perception of the effects of farm land degradation on yam production. It was also found that most of the yam farmers got their information on land degradation through agricultural extension (90.00%) and friends (8.00%). Though all yam farmers in the study area have equal chances of contact with extension agents some had more exposure to extension services. The differences in extension contact precipitate the differences in perception of the effects of farm land degradation. Aune (1995), noted that despite the devastating effects of land degradation, a good number of farmers hardly perceive the onset or extent of land degradation on their farm land. Agricultural extension education is one of the avenues opened to the farmer especially the rural farm families for linking up to the increasing globalization and modernization with a view to bringing changes to bear on their value systems, perception and farm practices

The way an individual perceives the differences of a given phenomenon is often influenced by his level of education and other intrinsic and extrinsic environmental factors. Williams *et. al* (1984) stated that the primary role of agricultural extension was educational rather than one of direct personal regulatory or political service to farmers. Agricultural extension helped to get the farmers into a frame of mind and attitude conducive to acceptance of new technology.

3.5 Relationship between Extension Contacts and Land Degradation Control Measures

The relationship between number of extension contacts and control measures adopted against land degradation was tested using Chi square test. The exact degree of relationships were tested by Phi coefficient and Cramer' v statistics. The results were presented in Table 5

From the secondary source of information the yam farmers were taught four main cultural practices of controlling

farm land degradation. These were mulching, terracing, use of organic manure and terracing. The results in Table 5 showed significant relationships between number of extension contacts, and mulching (X^2 =60.25, r= 0.71); organic manure application (X^2 = 55.03, r = 0.68); and avoidance of bush burning (X^2 = 86.40, r = 0.85). This meant that extension contacts had influence on the use of mulching, organic manure application and avoidance of bush burning. There was no significant relationship between extension contacts and terracing (X^2 =15.95, r= 0.37). This was due to the fact that the topography of the farms were fairly undulating. This connotes that terracing was not a required farm land degradation control measure in farm lands that are fairly undulating. Heyi and Mberengwa (2012) found that farmers access to extension services have predictive power in terracing. Those who had higher extension contacts invariably had higher chances of applying terracing

4. Conclusion and Recommendations

Education in the form of agricultural extensioncampaign has a pronounced effect on the perception of the effects and control measures against farm land degradation. Perception of the probable effects of farm land degradation provides the impetus to adopt concrete control measures. There was a significant and positive relationship between extension contact and perception of the effects of farm land degradation. A significant relationship was also found between extension contacts; mulching, organic manure application and avoidance of bush burning. Terracing was not a required farm land degradation control measure in farm lands that are fairly undulating. Considering the low level of formal education of the yam farmers, an orchestrated campaign and education should be carried out continually to educate the farmers on the effects and control measures against farm land degradation

References

Agbamu, J. U. 2005. Problems and prospects of agricultural extension in developing countries. In: Adedoyin, S. F. (ed). *Agricultural extension in Nigeria.* ilorin: Agricultural Extension Society of Nigeria, pp. 159-169.

Akinnagba, O. M. and Umukoro, E. 2011. Farmers perception of the effects of land degradation on agricultural activities in Ethiope East Local Government Area of Delta State Nigeria. Agricultural Conspectus Scientificus, 76 (2): 135 - 441

Anande-Kur, S. 1992. Land degradation and rural community life in Nigeria. In: Aina, E. O. A. and Adedipe, N. O. (eds). *Environmental consciousness for Nigerian National Development.* Federal Environmental Protection Agency(FEPA) Monograph, pp. 377-383

Asadu, C. L. A., Ezeauku, P. I. and Nnaji, G. U. 2004. Land use and soil management situation in Nigeria: An analytical review of changes. USA Journal of Outlook on Agriculture, 33 (1): 27-37

Aune, J. B. 1995. Predicting soil degradation in Tanzania: A system approach. Norwegian Journal of Applied Sciences, 21:47-49

Barrow, C. J. 1991. *Land degradation development and breakdown of terrestrial environments.* Cambridge : Cambridge University Press.

Beinroth, F. H., Eswaran, H., Reich, P. F. and Van Den Berg, E. 1994. Land related stresses in agroecosystems. In: Virmani, S. M., Katyal J. C., Eswaran, H. and Abrol, I. P. (eds). *Stressed ecosystems and sustainable agriculture*. New Delhi: Oxford and IBH, pp. 131-148

Ekpere, J. A. 1990. *Agricultural extension : searchlight of the Nigerian small farmer*. Ibadan : Ibadan University Press

Food and Agriculture Organization, FAO 2002. A*griculture data: land use*. Rome: Food and Agriculture Organization

Foth, H. D. 1978. *Fundamentals of soil science.* New York: John Wiley and Sons

Heyi, D. D. and Mberengwa, I.2012. Determinants of farmers land management practices: The case of Tole District South West Shewa Zone, Oromla National Regional State, Ethiopia. *Journal of Sustainable Development in Africa,* 14(1): 76-06)

Igwe. C. A., Akamigbo, . F. O. R., and Mbagwu, J. S. C. 1995. Physical properties of south eastern Nigeria soils and the role of some aggregating agents in the stability. *Soil Science,* 160: 431--440

kupers, H., Mollema, A. and Topper, E. 2005. Erosion control in the Tropics. *Agrodok – Series* No. 11. Wageningen: Agromisia Foundation

Lal, R. 1995. Erosion-crop productivity relationships for soils of Africa. *Soil Science Society of America,* 59:661-667

Ogunfiditimi, T. G. and Ewuola, S. O. 1995. *The synthesis of comparative agricultural extension systems.* Ibadan : Emmi Press Ltd.

Ovwigho, B. O. and Ifie, P. A. 2009. *Principles of youth development in Africa.* Benin-City: Ethiope Publishing Corporation

Ovwigho, B. O. 2012. *Application of the logical framework monitoring and evaluation model.* Germany : Lap Lambert Academic Publishing

Rosegrant, M. W. and Ringler, C. 1997. World food marketing into the 21st century : environmental, resource constraints and policies. *The Australian Journal of Agricultural and Resource Economics,* 41(September); 401 – 428

Reich, P. F., Numben, S. T., Almara, R. A. and Eswaran, H. 2011. Land resource stresses and desertification in Africa. In: Bridges, E. M., Hannam, I. D., Olderman, L. R., Pening Vries, F. W. T., Scherr, S. J. and Sompatpanit, S. (eds). *Responses to land degradation: proceedings of second international conference on land degradation and desertification,* Khon Kaen, Thailand: Oxford Press New Delhi, India

Scherr, S. J. and Yadav, S. 1996. *Land degradation in the developing world: implication for food, agriculture and the environment.* Washington D. C: International Food Policy Research Institute

Swanson, B. E. 2008. *Global review of good agricultural extension and advisory services*. Rome: FAO

Technical Centre for Agricultural and Rural Cooperation, CTA 2011. Three steps towards modernisation of agriculture. *Spore*: Special Edition, August, 2011, pp.18-22

Technical Centre for Agricultural and Rural Cooperation C T A 2003. Agricultural extension: the end of the line. *Spore* No. 108, p.8

United States Agency for International Development, USAID 2011. Rural extension and advisory services. USAID Agriculture

Williams, S. K. T., Fenley, J. M., and Williams, C. E. 1984. *A manual for agricultural extension workers in Nigeria.* Ibadan : Les Shyraden

World Bank 2007. Ethiopian accelerating equitable growth country: economic memorandum part ii *Thematic Chapters, Poverty Reduction and Economic Management Unit Report* No. 38662-ET

Table 1: Summary description of demographic characteristics of respondents

Characteristics	Minimum	Maximum	Mean	Standard deviation
Age	18.00	71.00	47.77	11.44
Level of Education	0.00	18.00	9.41	4.41
Farming Experience	1.00	20.00	7.05	3.93
Household size	0.00	12.00	4.55	2.58
Farm Size	2.00	20,00	8.74	4.13

Table 2: Distribution of respondents according to frequency of extension contact

Number of Extension Contact	Frequency	Per cent	Mean
0.00	12	10	
1.00	21	17.5	
2.00	18	15.0	
3.00	15	12.5	
4.00	16	13.3	
5.00	8	6.7	
6.00	6	5.0	3.93
7.00	4	3.3	
8.00	6	5.0	
9.00	1	0.8	
10.00	5	4.2	
11.00	1	0,8	
12.00	7	5.8	
Total	120	100.0	

Table 3: Perception of effects of farm land degradation on yam production

S/N	Statement	Maximum	Mean	Std, Deviation	Remarks
1	Land degradation could cause famine	4.00	2.78	1.02	Agree
2	Land degradation could lead to low yam yield	4.00	2.71	0.91	Agree
3	Land could cause low quality of yam	4.00	3.14	0.77	Agree
4	Land degradation could reduce social life of yam producers in the community	4.00	2.48	0.83	Disagree
5	Causes tussle and pressure on available land	4.00	2.51	0.93	Agree

Table 4: Correlation between perception of effects of farm land degradation and extension contact (N = 120).

Variables	Extension Contact	Perception of Effects
Extension Contact Pearson Correlation	1	0.87
Significance (1 Tailed test)		0.00
Perception of Effects Pearson	0.87	1
Correlation	0.00	
Significance (1 Tailed test)		

Table 5: Chi square tests and degree of relationship between extension contacts and control measures against farm land degradation

Control Measures	X^2	DF	Sig	Phi Coefficient	Cramer's V
Mulching	60.25	12	0.00	0.71	0.71
Terracing	15.95	12	0.19	0.37	0.37
Organic Manure Application	55.03	12	0.00	0.68	0.68
Avoidance of bush Burning	86.40	12	0.00	0.85	0.85