



ROLES OF EXTENSION SERVICES IN ADOPTION OF AGROFORESTRY PRACTICES AMONG FARMERS IN SOUTH WEST NIGERIA

Akinwalere B.O¹⁺
Okunlola J.O²

^{1,2}Department of Agricultural Extension and Communication Technology,
Federal University of Technology Akure, P.M.B 704 Akure, Nigeria
¹Email: bakinwalere@yahoo.com



(+ Corresponding author)

ABSTRACT

Article History

Received: 12 October 2018

Revised: 22 November 2018

Accepted: 24 December 2018

Published: 4 February 2019

Keywords

Agroforestry

Adoption

Farmer

Extension.

The study examined the roles of extension in the adoption of agroforestry practices in South west Nigeria, with a view to providing data on the practices of agroforestry in the area. It highlighted the extent of agroforestry, the ownership and management of agroforestry practices, the utilization and sustainability of the practices, as well as the challenges faced by farmers practicing agroforestry. Multi-stage sampling technique was used to select 200 agroforestry farmers. A large proportion (82%) of the respondents are married and the mean age was 52years. Majority (81.5%) of them had formal education while 92% are involved in farming as their primary occupation. 39.5% of the respondents are involved in the practice of shelter belt and wind breaks, 35% are involved in improved fallow, 24% in Taungya, 22% in fuel wood production, 16% in the practice of Alley cropping, 10% in Tree on range land, while 7% and 2.5% are into home garden and apiculture respectively. About half (54.5%) of respondents had no contact with extension services, access to extension service in the study area as rated by farmers is an indication of low extension agent to farmer ratio. The result of Pearson moment correlation coefficient showed that there was no significant relationship between extension contacts and sustainable adoption of agroforestry practices ($r = 0.12$, $p = 0.07$).

Contribution/Originality: The study examined the roles of extension services in the adoption and utilization of agroforestry practices by farmers. It discussed the various agroforestry practices available, the acceptability and perception of the farmers. The study also revealed the lack of proper extension services needed for successful implementation of any adoption process.

1. INTRODUCTION

In Nigeria, the goal of agricultural extension policy is “To achieve a well-organized extension system for efficient and effective extension delivery in all aspects of sustainable agriculture and rural development towards the attainment of food security, poverty reduction, rural empowerment and environment management” (Federal Ministry of Agriculture and Rural Development, 2000). The goal of agricultural extension to farmers by the Federal Ministry Agriculture and Rural Development (FMARD) can only be achieved when extension services to rural farmers are farmer driven and environment friendly extension, the use of appropriate extension approach and methodologies, decentralization of the extension system and activities, extension support to all categories of farmers, efficient and effective extension service delivery system, adequate training of extension personnel and sustained funding of agricultural extension delivery.

In effect, when the above are put in place, FMARD (2000) recognized some important benefits which agricultural extension activities will easily give agroforestry management in Nigeria, such benefits include, Provision of training facilities and infrastructures, establishment of effective communication channels among research, extension and farmers, effective utilization of extension service as agent for technology transfer, establishment of demonstration farm and rural processing centers; and encouragement of the private sector to invest in agricultural information and dissemination.

Constraint to agroforestry practices among farmers in Nigeria is a multi-facetted issues, both from the farmers' angle, government and the society. In farmers' point of view, whenever they have to decide to apply a new production model or not, they always consider three aspects including: feasibility, profitability and acceptability (Franzel, 2002). Feasibility means that whether farmers get enough knowledge to manage new technology and cultivation techniques or not; and they have capital and necessary information to apply these technique. It includes support of government, experience of farmers, labor, land, and capital. For profitability, farmers calculate whether applying new technique is more economically effective than other techniques that they can practice or not. It is explained by crop productivity, labor cost and so on. Acceptability appears when farmers realize that advantages getting from these systems are higher than its disadvantages. Acceptability concerns about environmental awareness, poverty, and gender issue, etc. To make decision in applying a new technique like innovative agroforestry practices, farmers in Nigeria, various issues have been raised on the role of extension in adoption and acceptability of the practice.

In view of the above, the study was carried out to identify the determinants of adoption of agroforestry practices among farmers in South west Nigeria. Specifically the following objectives are to ascertain the socio-economic characteristics of the farmers, identify the agroforestry practices of the farmers and to determine the effects of extension activities on adoption of agroforestry practices by the respondents.

This hypothesis stated in a null form was tested:

Ho: There is no significant relationship between extension contacts and adoption of agroforestry practices.

2. METHODOLOGY

The study was conducted in Southwest zone, Nigeria, consisting of farmers practising agroforestry in both Ondo and Osun States, Nigeria. Multistage sampling was used for the study. Ondo and Osun states were randomly selected among the states in South West Nigeria. Three local government areas where agroforestry practices were prominent were purposively selected from each state. Ife Central, Oriade and Ila Local government areas in Osun State, Akure North, Ose and Owo local government areas in Ondo State were chosen. Two communities from each local government area were randomly selected. Each community was divided into three wards out of which one was randomly selected. From each ward eighteen farmers were randomly selected and interviewed, given a total of 36 respondents from each local government area and a total of 216 for the two states. However 200 instruments of data collection were utilized for the analysis. Focus group discussion and observation technique were also used to obtain information from the farmers. Descriptive and inferential statistics were used to analyze the primary data. This includes the use of frequency and percentage, Chi square and Regression analysis. Likert scale was also used to measure the perception of respondents concerning agroforestry practices.

3. RESULTS AND DISCUSSION

3.1. Socioeconomic Characteristics of the Respondents

Most of the farmers were middle aged (Mean age of 52years), ranging between 26 and 86 years of age. This implied that most of the respondents were in their active years and as such could participate effectively in agroforestry activities. Sixty-eight percent of the respondents were however male, while 32% were female. This implies that there is dominance of male gender in farming activities and also in adoption of new improved

technology. Alfred (2001) and Adedotun *et al.* (2010) stated that male headed households usually out-number female headed household in most communities in Nigeria. Majority of the respondents (82%) were married, only 3% were single; 13% were widowed, while 2% were divorced. A large proportion (81.5%) of the respondents had both formal and non-formal education while 18.5% did not have any form of education. This result supports the earlier findings of Okunlola and Jimoh (1994) and Iwala (2004) that education is related not only to the ability to obtain and process information, but also to the use of more sophisticated techniques by the farmers. Forty-nine percent were household heads. Majority of farmers (83%) were Christians, while 17% were Moslems. majority of the respondents (51%) have been in farming business more than 15years.

3.2. Forms of Agroforestry Practices Adopted

These were observed mainly during field visit, personal interviews with respondents and Focus Group Discussion (FGD). The forms of agroforestry in the study area are shown in Table 1 and were observed to be as follows:

3.3. Improved Fallow

This involves deliberate setting aside of the farmland for fallow period for the land to regain its fertility. The farmland could be improved through supplementation of the natural growth with suitable woody species during the fallow period, which might have the potential to restore soil fertility more rapidly and at the same time provide one or more useful products. This idea was highly embraced in the study area as 35% of the respondents practiced improved fallow system (Table 1). During FGD farmers stated that they find it convenient and better to move from one farm location to the other through shifting of farming activities to replenish the soil nutrient for better crop yield. And this is made possible since most (45%) of respondents had their farms located as different places. The respondents further explained that during fallow system, trees planted are left on the farm to grow and serve as fuel wood, and on returning to that piece of land they are cut and the little ones left to grow to maturity again. The above result is contrary to Kang *et al.* (1999) that improved fallow may no longer support the needs of farmers in Nigeria because of the increasing population pressure and attendant short fallow resulting in soil deterioration and ecological imbalance

3.4. Taungya

This is a form of agroforestry practice in which crops are grown among young trees only until the tree canopy closes. It was observed that farmers located in forest zone of Ifon in Ondo State mostly carried out this particular type of agroforestry practice and they constitute 24% of the total respondents (Table 1). Land ownership pattern is the major determinants of adopting this type of agroforestry practice, because farmers were not allowed planting of other trees except teak. The practicing of taungya is done by planting teak with some food crops for about 2 to 3 years, when the teaks start forming canopy the farmers move to another plot of land to start another farming season. During Focus Group Discussion, farmers expressed their interest in the establishment of plantation by planting teak especially; this is an indication that Taungya system has been successful there. Although the trees belong to the government, opportunities exist for the farmers to become forest concessionaries, and to take part in logging and transportation.

3.5. Alley Cropping

Under alley cropping, arable crops are grown between hedgerows of planted shrubs and or trees, especially leguminous species which are periodically pruned to prevent shading of food crops. In the study area, the result showed that 16.5% of the respondents engaged in alley cropping practice. The periodic pruning provides manure to

the soil, fodder for animals and fuel to the farmer. During the focus group discussion, it was discovered that farmers have been encouraged to plant Moringa as alley, and this is surely of great benefits to the farmers in diverse ways.

3.6. Shelterbelts and Wind Break Live Hedges

Result from the study showed that 39.5 percent of the respondents planted trees round their farmland to reduce the velocity of winds across agriculture crops (Table 1). Types of trees planted included Milena tree, "Afon" tree, oranges trees, etc. It was revealed that the fruit from "Afon" tree is medicinal and that Milena tree is good as building materials and firewood. The reason why most of the respondents engage in this type of practice could be because the farmers are yet to be fully involved in agroforestry practices, they prefer to plant trees round their farmlands to prevent wind erosion and also to serve as farm boundary, instead of planting trees on the main land that will not bring economic benefit as their farm crops. This result showed that majority (39.5%) of farmers in the study area engage in agroforestry practices mainly because of the environmental benefits not because of any economic benefit.

3.7. Fuel Wood Production

Fuel wood production is one of the agroforestry technique adopted by the respondents. About 22.5% practiced this. The farmers stated that during fallow period, some trees are deliberately left on the fallow land to reach maturity, purposely for firewood production. At the end of the fallow period, they are cut and the land used for another farming operation.

Other agroforestry techniques practiced by the respondents in the study area were Tree on rangeland or pasture, Home garden involving animals and Apiculture with trees; an equal proportion of 2.5% in Apiculture many farmers are not into honey production this formed the basis of the small number recorded.

Many farmers, especially female farmers, claimed they were involved in livestock production not necessarily in large number, and since their farmland is not far from the homestead, there is no need for home garden. This forms the basis for the low adoption of home garden involving animals' technique of agroforestry practices.

Table-1. Distribution of Respondents according to the type of Agroforestry Participated in.

| Agroforestry Practices | Frequency | Percentage |
|------------------------------------|-----------|------------|
| i. Improved fallow | 70 | 35.0 |
| ii. Taungya | 48 | 24.0 |
| iii. Alley Cropping | 33 | 16.5 |
| iv. Shelter belts and wind break | 79 | 39.5 |
| v. Fuel wood production | 45 | 22.5 |
| vi. Tree on range land or pasture | 20 | 10.0 |
| vii. Home garden Involving animals | 14 | 7.0 |
| viii. Apiculture with trees | 5 | 2.5 |
| Total | 314** | |

** Multiple responses

Source: Field Survey, 2012

3.8. Frequency of Visit of Extension Agents

Table 2 showed the frequency of visit of Extension Agents to the farmers among the respondents. About half (54.5%) of respondents had no contact with extension services for the past three years. The table also showed that only 18.5% of the respondents had access to the agents forth nightly, 7% were visited monthly and 20% quarterly

Table-2. Frequency of Extension Visit to Farmers

| Frequency of Visit | Frequency | Percentage |
|--------------------|-----------|------------|
| No of visitation | 109 | 54.5 |
| Forthnightly | 37 | 18.5 |
| Monthly | 14 | 7.0 |
| Quarterly | 40 | 20.0 |
| Total | 200 | 100 |

Source: Field Survey, 2012

3.9. Access to Information by the Respondents

Table 3 showed that access to information on agroforestry practices by the respondents was extremely low through extension agents. Majority of the respondents (50%) obtained information through non- governmental organizations, such as the Rural Development Programme (RUDEP) (Osun state). Twenty-three percent of the respondents obtained information through extension agents. About 19.5% obtained theirs from relative and friends, the remaining percentage of 7.5% from mass media.

Access to extension service in the study area as rated by farmers is an indication of low extension agent to farmer ratio. Activities of a non-governmental organization, RUDEP was very predominant in Osun State with which almost all the farmers/respondents had good working relationship on agroforestry practices. Although the presence of extension agents are felt but not as much as that of RUDEP and Leventis foundation. In fact, most of the respondents in Osun State claimed agro-forestry practices were introduced to them by RUDEP in 1997.

Table-3. Access to information by the Respondents

| Source | Frequency | Percentage |
|----------------------|-----------|------------|
| Mass Media | 15 | 7.5 |
| Extension Agent | 46 | 23.0 |
| NGO | 100 | 50.0 |
| Relative and Friends | 39 | 19.5 |
| Total | 200 | 100.0 |

Source: Field Survey, 2012

3.10. Effect of Extension Activities on Farmers' Adoption of Agroforestry Practices

Table 4 revealed the outcome of respondents view about the activities of the extension agents. Most of the respondents could not decide whether extension agents had really made any impact on their decision to adopt agroforestry practices or not. About 19.5% of the respondents agreed that extension agents provided information needed on agro forestry practices while 48% could not decide, 18% disagreed, that extension did not provide information about agroforestry practices. On the need for adequate training, 42.5% were undecided, 30.5% disagreed, 18.5% agreed and only 8.5% strongly agreed that training needed in the use of agroforestry practices has really been provided through extension services. On the whole, a total of 31% of the respondents agreed that extension services has contributed a lot in the area of improvement on their agricultural practices, while about 25.5% disagreed nevertheless 30.5% of the respondents still agreed that extension services has helped to enhance their income through adoption of agroforestry practices. Other areas where extension activities are being felt included increase cost of farming where 21% agreed, majority (42%) could not decide, 29.5% disagreed. About 56.5% of the respondents disagreed that extension activities on their agroforestry involvement had really made farming more time consuming for them.

Forty-two percent of the respondents could not say whether extension activities has really brought improvement in farm yield or not, 18.5% of the respondents strongly agreed that through the services rendered by extension agent there has been tremendous increase in their level of farm outputs, and this is also strongly supported by a few respondents constituting 7.5% of the respondents. Thirty-two percent of the respondents believed that involvement in agroforestry practices through extension activities has really made the farming practices more expensive, this could be because of cost associated with adoption of any new production practices.

Twenty-five percent disagreed, and less than half (44%) were not sure whether extension activities has really made agroforestry practices more expensive for them or not. This could be because of their lack of adequate record keeping. Nevertheless, 28.5% of the respondents still agreed that adequate information needed, that really affect farming environment were provided by extension agents through their adoption of agroforestry practice.

Table-4. Respondents Perceptions of the Effects of Extension Activities on Agroforestry practices

| Statements | Strongly Agreed | Agreed | Indifference | Disagreed | Strongly disagreed | Mean Score |
|--|-----------------|---------------|---------------|---------------|--------------------|------------|
| | Freq.(%) | Freq.(%) | Freq.(%) | Freq.(%) | | |
| i. Provided information on agroforestry practices | 29 (14.50) | 39 (19.50) | 96 (48.00) | 36 (18.00) | - | 3.3 |
| ii. Provided training on agroforestry practices | 17 (8.50) | 37 (19.50) | 85 (42.50) | 61 (30.50) | - | 3.1 |
| iii. Enhanced source of income through agroforestry | 23 (11.50) | 38 (19.00) | 74 (37.00) | 62 (31.00) | 3 (1.50) | 3.1 |
| iv. Increased cost of farming through agroforestry | | 42 (21.00) | 84 (42.00) | 58 (29.00) | 1 (0.50) | 3.1 |
| Increased farm output through agroforestry | 15 (7.50) | 37 (18.50) | 84 (42.00) | 54 (27.00) | - | 3.2 |
| vi. Improved agricultural practices through agroforestry | 25 (12.50) | 37 (18.50) | 76 (38.00) | 49 (24.50) | 2 (1.00) | 3.3 |
| vii. Made agroforestry practices more expensive | 36 (18.00) | 43 (21.50) | 88 (44.00) | 48 (24.00) | 2 (1.00) | 3.2 |
| viii. Provided information on farm environment | 19 (9.50) | 38 (19.00) | 78 (39.00) | 53 (26.50) | 3 (1.50) | 3.2 |
| ix. Made farming more time consuming | 28 (14.00) | - | 87 (43.50) | 93 (46.50) | 20 (10.00) | 2.3 |

Figures in parenthesis : percentages
 Source: Field Survey, 2012

3.11. Hypothesis

The result of Pearson moment correlation coefficient shows that there was no significant relationship between extension contacts and sustainable adoption of agroforestry practices ($r = 0.12, p = 0.07$). This however contradicts the findings of Angba (2000) and Iwala (2004) they found separately that contacts with extension services has effect in adoption of farmers. There is obvious decrease in extension visit to the farmers since many constraints do face the extension agents, dawdling fund, poor transportation, low ratio of extension agents to farmers.

Farmers suggested that the number of extension agents to farmers should increase as a way to improve extension services in the study area. Therefore, the null hypothesis is accepted at 5% level of significance.

Table-5. Correlation coefficient of the relationship between Extension contact and adoption of agroforestry practices.

| Variable | R | P value | Decision |
|---|--------|---------|----------|
| Extension contact - adoption of agroforestry practices. | 0.126* | 0.076 | NS |

*Not significant
 Source: Computed from Field data,2012

4. CONCLUSION

Low access to extension service in the study area as rated by farmers is an indication of low extension agent to farmer ratio and access to information on agroforestry practices by the respondents was extremely low through extension agents. Majority of the respondents obtained information through non- governmental organizations. It was shown that various determinants cutting across personal factors, social factors and environmental factors contributed to adoption of agroforestry practices in the study area also the number of extension agents to farmers should increase as a way to improve on the sustainability.

Funding: This study received no specific financial support.

Competing Interests: The authors declare that they have no competing interests.

Contributors/Acknowledgement: Both authors contributed equally to the conception and design of the study.

REFERENCES

- Adedotun, A., O. Morenikeji and A. Odaibo, 2010. Knowledge, attitudes and practices about Malaria in an urban community in South-Western Nigeria. *Journal of Vector Borne Diseases*, 47(3): 155-160.
- Alfred, S.D.Y., 2001. Socioeconomic and psychological factors affecting the adoption of agricultural innovation by farms household in Kogi State Nigeria. (Unpublished Ph.D Thesis). Federal University of Technology, Akure Nigeria.
- Angba, A.O., 2000. Determinant of Sustained use of Selected technologies recommended to farmers by Cross River State Agricultural Development Programme(ADP). (Unpublished Ph.D Thesis) University of Ibadan, Nigeria.
- Federal Ministry of Agriculture and Rural Development, 2000. Agriculture in Nigeria: The new policy thrust. Published by Agricultural Research Council of Nigeria ARCN 2000.
- Franzel, S., 2002. Scaling up the benefits of agroforestry research: Lessons learned and research challenges. In Steven Franzel and collaborators (eds), *Development and Agroforestry Scaling Up the Impacts of Research*. Oxfam GB and ICRAF. pp: 156-169.
- Iwala, O.S., 2004. Socio-economic factors affecting the adoption of technological innovation by smallholder oilpalmfarmers in Edo and Ondo States of Nigeria. (Unpublished Ph.D Thesis). Federal University of Technology Akure, Nigeria.
- Kang, B.T., A.N. Atta-Krah and L. Reynolds, 1999. Alley farming. The Tropical Agriculturist series. CTA Macmillan Technical Publication 918.
- Okunlola, J.O. and O.A. Jimoh, 1994. Radio agricultural programmes and technological adoption among food crop farmers in Ondo State, Nigeria. *CITADEL*, 1(2): 248-258.

Views and opinions expressed in this article are the views and opinions of the author(s), International Journal of Sustainable Agricultural Research shall not be responsible or answerable for any loss, damage or liability etc. caused in relation to/arising out of the use of the content.