ASSESSMENT OF INFORMATION CHANNELS FOR TECHNOLOGY ADOPTION AMONG FARMERS WHO CULTIVATE UNDER UTILISED LEGUMES IN OKE - OGUN AREA OF OYO STATE, NIGERIA

Abstract

The production of the underutilised legumes in Nigeria is at a very low ebb, attempt to increase its production requires adoption of improved technologies on the crops. Hence, Information channels for technology adoption among farmers who cultivate underutilised legumes in Oke-Ogun area of Oyo State was therefore investigated. A multi-stage sampling procedure was used and 75 respondents were selected through snowball technique. Results indicate that 49.3% of farmers were above 50 years, majority were male (81.3%),married (76.0%) and educated (67.6%). Majority of the respondents had high access to radio ($\bar{x}$=1.81) and farmers' association ($\bar{x}$=1.41) for information on underutilized legumes and preferred radio ($\bar{x}$=0.93) and extension agents ($\bar{x}$=0.92) as major sources of information dissemination. Poor seed viability ($\bar{x}$=1.78) and poor yield ($\bar{x}$=1.77) were the major constraints limiting production of underutilised legumes in the study area. There was significant relationship in the respondents' educational status (χ^2 =10.363; p=0.016) and information channels for technology adoption among farmers who cultivate underutilised legumes. It is recommended that research institutes should carry out studies with a view to generate technologies that would alleviate constraints faced by farmers in the production of lesser legumes.

Keywords : underutilised legumes, information dissemination strategies, limabean , pigeonpea.

INTRODUCTION

Recent development portends that the analysis of food insecurity especially adequate nutrition need to be carried out in a dynamic and more comprehensive context. The myopic focus on cowpea and soybean as the major vegetable source of protein in the diet especially in sub-sahara African countries must be reconsidered for sustainable livelihood of the farm families and improved nutrition of the ever increasing population.

Attempts to focus on technology generation and dissemination of the underutilised legumes such as pigeon pea (Cajanus cajan), lime bean (Phaseolus lunnatus luna) ,African yam bean (Sphenostylis stenocarpa) and Bambara groundnut (Vigna subtarranea Thurs) would be a

right step in the right direction and additional efforts towards strenghtening the new agricultural transformation programmes in Nigeria. The underutilised legume crops due to their rich nutritional profile, high adaptability to adverse climatic conditions and ability to grow in poor soils are highly advantageous for sustainable cultivation. Because of their high drought tolerance and excellent nutritional profile comparable to commercially available legume crops (soybean, peanut and cowpea), these could potentially provide sustainable food and feed resources in the future. The richness of these crops in protein can support the global protein demand in future to partially or completely replace other animal proteins in the human diet. Intense agronomic, genetic and applied research is required to move these crops out of obscurity and to use their potential as cash crops.

Equally important is the fact that underutilised leguminous crops provide economic benefits for farmers. Farmers can grow these crops on their own, or as part of crop rotation systems or inter-plant them with other crops. This will definitely yield more income. Furthermore, when farmers have a wide range of crops to choose from in a crop rotation system, the cycles of some pests and diseases are disrupted and infestation possibilities are minimized. It also allow farmers to have more sustainable production system. In addition, encouraging the cultivation of underutilised legumes for food will boost the livelihoods of small holder farmers.

For us to make food security a reality in developing countries, we must bring back into the food value chain over forgotten and underutilised crop species. We must also seek to promote the consumption of local cuisines and develop ways to lessen the burden of methods of preparing some of these food crops.

Due to their resilience to drought, poor soil and weather conditions, underutilized legumes may also help to stem the decline in food crop production caused by climate change (Karigidi, 2018). There is a need to make stronger the gains and propose a strategic way of translating underutilised crops into main stream agriculture (Okigbo and Anyaegbu,2021).

To achieve this, research must concentrate on the development of adaptable and adoptable technologies aimed at improving the genetic potentials, yield adaptation and nutritional quality of the underutilised legumes. It is also speculated that adoption of the technologies generated for the improvement of the productivity of the underutilised legumes depend heavily on the effectiveness of the communication strategies or channels used for the transferring of the generated technologies to farmers.

Adequate dissemination of information to farmers at the grassroot level, therefore, would not only create the awareness of the need for change but would also explore all avenues and methods of production so that desired change is achieved (Amusat and Oyedokun, 2018).

Information dissemination strategies or channels of information dissemination for technology adoption among farmers who cultivate underutilised legumes need to be assessed so that researchers efforts would not be in futility. This will go a long way in enhancing the adoption of the technology generated and consequently increase the production of lesser legumes.

Objectives of the study

The general objective of the study was to assess the information channels for technology adoption among underutilised legumes' farmers. It specifically identified personal characteristics of farmers, information channels , frequency of accessing information from the available channels and factors that constrained farmers from production of lesser legumes.

Methodology

The study was conducted among farmers who cultivate underutilised legumes in Oke-Ogun area of Oyo State, Nigeria. Oke-Ogun area is the Northern part of Oyo State and popularly referred to as the food basket of the State. Oke Ogun area is made up of 10 out of 33 LGs in Oyo State with a population of about 1.5 million according to 2006 National census.

A multi stage sampling procedure was used to select samples for this study. In the first place, 30% of the local governments in Oke-Ogun area were randomly selected. This gave a total of 3LGs from the 10LGs in the area. In the second stage, from the sampled local governments, five wards were randomly selected from each local government making a total of 15 wards. Thereafter, 5 farmers who cultivate underutilised legumes were selected through snowball technique from each ward. The farmers were selected because of their regular cultivation of underutilized legumes. Therefore, 75 respondents were used for this study.

Variable measured include strategies of information dissemination, frequency of accessing information from the available methods and constraints experienced by farmers in the production of underutilized legumes.

For available information dissemination methods or channels, a list of methods were provided and the respondents were asked to indicate their preference.

Accessibility was measured as always, occasionally and never. 2, 1 and 0 were assigned as scores.

A list of constraints usually experienced by farmers on the production according to literature were provided and respondents were asked to rate each constraint as Serious (2) ,Mild 1 and Not a constraint (0)

Results and Discussion

Table 1

Distribution of Respondents by their personal characteristics n=75

Age	**Frequency**	**Percentage**
20-29	11	14.7
32-39	7	9.3
40-49	20	26.7
50-59	25	33.3
≥ 60	12	16.0
Sex		
Male	61	81.3
Female	14	18.7
Marital Status		
Single	10	13.3
Married	57	76.0
Divorced	5	6.7
Widowed	3	4.0
Religion		
Islam	37	49.3
Christianity	34	46.4
Traditional	4	5.3
Education		
Primary	21	28.0
Secondary	19	25.3
Tertiary	13	17.3
None	22	29.4
Household size		
1-3	10	13.3
4-6	56	74.7

7 and above	9	12.0
Associations		
Cooperative	31	41.3
Farmers association	7	9.3
Social group	3	4.0
Age group	3	4.0
Cosmopoliteness		
Every 2 week	2	2.7
Monthly	8	10.7
Every 6 months	16	21.3
Yearly	30	40.0
Never	19	25.3
Income		
80,000-120,000	20	26.7
130,000 -17000	28	37.4
180,000 -220,000	27	35.9
Acreage devoted to lesser legumes		
1 – 2	22	29.3
3 - 4	28	37.3
5 – 6	17	22.7
6.1 above	8	10.7
Farming Experience		
1 – 4	14	18.7
5 – 8	18	24.0
9 – 13	11	14.6
14 – 17	13	17.3
18 and above	19	25.4
Types of lesser legumes		
African yam beans	12	16.0
Pigeon pea	35	46.7
Lima beans	18	24.0

Bambara Groundnut	10	13.3
Cropping System		
Monocropping	12	16.0
Mixed Cropping	6.3	84.0
Contact with Ext Agents		
Yes	34	45.3
No	41	54.7
Sources of Inputs		
Government	1	1.3
Open market	59	78.7
Agro dealers	15	20.0
Sources of seed		
Previous harvest	26	34.7
Fellow farmers	40	53.3
Agro-Input	4	5.4
Open market	5	6.6

Source : Field survey,2019

Respondents' personal characteristics

Information available in Table 1 shows that most of the underutilised legumes' farmers (49.3%) were above the age of 50. This indicates that most of them are getting old and may not be too keen on learning modern system of farming. This may be due to the fact that lesser legumes are traditional crops growing mostly for local consumption.

Overwhelming majority of the farmers were male (81.3%) which means men are highly involved in the production of lesser legumes crops. This may be due to the strenous nature of agricultural enterprise especially growing of lesser legumes. The finding is in consonance with earlier study by Yekinni et al (2015) who reported similar trend in agriculture.

The study also found that majority (76.0%) of the respondents were married while only 13.3% of the respondents were single. This emphasises the importance of marriage in the rural areas where the study was carried out as no adult would be regarded as responsible without marriage.

The study also found that the two religions mostly practiced in the study area were Islam (49.3%) and Christianity (46.4%). This is in line with Yekinni and Oguntade (2014).

The data on educational attainment revealed that 67.6% of the respondents had one form of education or the other. Only 29.4% did not have formal education. According to Oladeji (2011), farmers are not totally illiterates but had one form of education or the other. The level of education attained by farmers determine their ability to perceive, interprete and correctly determines action that would possibly enhance their performance in farming activities. Majority of farmers in the study area had between 4-6 persons as their household size. This depicts fairly large size which is a normal trend in farming communities (Amusat, 2018).

Majority of the respondents belong to different associations; cooperative societies (41.3%), farmers association (45.4%) and social group (9.3%).

On cosmopoliteness, the study reveals that most farmers (40%) barely moved out of their village and as a result may not be exposed to modern technique of farming and may also have limited knowledge. This will likely affect their output.

The table also reveals that majority of the respondents (37.4%) who grow underutilised legumes in the study area were on income of between N130,000-N170,000 per annum. This is appreciably low and an indication that lesser legume does not command good price in the market and may also be affected by some production constraints which reduce the yield. The study also found that most farmers (37.3%) had 3-4 acres of lesser legumes. This is in line with the earlier finding that majority of farmers in Nigeria are small holders, cultivating less than 5 hectares of farm land (Ogunbodede,2011). The result of the year of experience in under utilised legume cultivation revealed that most (25.4%) of the respondents were having 18 years and above experience. This implies that underutilised legumes production is an age long farming activity in the study area. The result on type of underutilised legumes planted in the study area revealed that majority planted pigeon pea (46.7%) ,followed by lima beans (24.0%). It was also found that majority of the respondents practiced mixed cropping (84.0%). This is expected as mixed cropping is a kind of insurance among farmers and tend to guide against crop failure.

Majority of farmers (54.7%) were not having regular contact with extension agents who were to disseminate improved system of farming to them. This could be due to dearth of funds experienced by the Oyo State Agricultural Development Programme in the last few years (Amusat, 2018) and also lack of emphasis on lesser legumes as against grain legumes like cowpea and soybean.

The table also reveals that majority of the respondents sourced their inputs from open market (78.7%). This may affect the quality of inputs used by farmers and may likely affect the yield. The table also revealed that majority of farmers (53.3%) sourced their seed from fellow farmers. This may be due to the fact that research institutes with mandate on legumes neglected breeding work on lesser legumes but laid too much emphasis on major legumes like cowpea and soybean to the detriment of the lesser legumes.

Table 2

Distribution of respondents preference to Information channels

Strategies	Mean	Rank
Radio	0.93	1st
Extension Agents	0.92	2nd
Farmers guides	0.04	5th
Television	0.01	6th
Mobile phones	0.49	4th
Farmers' association	0.82	3rd

Source : Field survey,2019

Preference to Information Channels

The data in Table 2 reveals that majority of farmers who cultivate underutilised legume in the study area believed that radio ($\bar{x}$=0.93) was the most preferred medium of information channels and it ranked 1st, followed by extension agents ($\bar{x}$=0.92) which ranked 2nd, then farmers' association ($\bar{x}$= 0.82) which ranked 3rd. This finding validates Yahaya (2008) and Ajayi (2003) which had earlier acknowledge radio as veritable source of information.

Table 3 Distribution of respondents by frequency of access to information dissemination strategies

Strategies	Mean	Rank
Radio	1.81	1st
Extension agents	1.02	3rd
Farmers guides	0.38	6th
Television	0.40	5th
Mobile Phones	0.94	4th
Farmers' association	1.41	2nd

Source : Field survey,2019

Access to Information channels

Table 3 reveals that majority of the respondents affirmed that radio ($\bar{x}$=1.81) , farmers' association ($\bar{x}$=1.41) and extension agents ($\bar{x}$=1.02) were more accessible to farmers on dissemination of information on underutilised legumes as compared to television ($\bar{x}$=0.40) and farmers'guides ($\bar{x}$=0.38).The findings suggest that wide range of information channels were available to farmers who grow underutilised legumes in the study area. While radio has been widely acknowledged as veritable information source ,farmers' association is another major means of getting information by all categories of farmers.

Table 4 Distribution of respondents by constraints to production of underutilised legumes.

Constraints	**Mean**	**Rank**
Inadequate seed supply	1.13	6th
Poor seed viability	1.78	1st
High pest infestation	0.26	10th
Disease infestation	0.22	11th
Poor yield	1.77	2nd
Lack of good market	1.76	3rd
Poor storage quality	1.06	8th
Lack of support from government	1.53	4th
Inadequate Technology diffusion on the improvement	1.08	7th
Too much emphasis on the major legumes by research Institutes	0.93	9th

Source : Field survey,2019

Constraints to production of underutilised legumes.

Table 4 shows that the most serious constraints against production of underutilised legumes in the study area were poor seed viability ($\bar{x}$=1.78), poor yield ($\bar{x}$=1.77) and lack of good market ($\bar{x}$=1.53). To overcome some of these identified constraints, the need for various government agencies especially agricultural research Institutes to carry out study with a view to generate technologies that would produce quality seeds and disseminate same to farmers

cannot be over emphasised. Poor yield and lack of good market are two major factors that can discourage farmers from production of lesser legumes.

Table 5 Chi-square analysis of relationship between respondents' personal characteristics and information channels among farmers who cultivate underutilised legumes in Oke-Ogun area of Oyo State.

Variable	χ^2	Df	p-value	Remark
Sex	0.218	1	0.641	NS
Marital status	2.439	3	0.486	NS
Education	10.363	3	0.016	S

Source :Field survey,2019

Respondents' personal characteristics and information channels among farmers who cultuvate underutilised legumes in Oke-Ogun area of Oyo State.

Table 5 presents the result of Chi-square analysis of relationship between respondents' personal characteristics and information channels among farmers who cultivate underutilised legumes in Oke-Ogun area of Oyo State.

The result shows that there was significant difference between farmers' educational attainment and information channels of farmers in the study area. This implies that education has roles to play in the information channels used by farmers who cultivate underutilised legumes in the study area. The result also shows there were no significant difference between the respondents' sex (p= 0.641) and marital status (p=0.486).This implies that neither sex nor marriage affects or influences information channels of farmers.

Table 6 Relationship between respondents' age and information channels among farmers who cultivate underutilised legumes in Oke-Ogun area of Oyo State.

Variable	Df	r-value	p-value	Remark
Age	3	0.060	0.611	NS

Source : Field survey, 2019

Table 6 above shows that there was no significant relationship between the age of farmers and information channels of farmers who cultivate underutilised legumes in Oke –Ogun

area of Oyo State. This implies that age has nothing to do with information channels of respondents in the study area.

Conclusion and Recommendation

Based on the findings, it is evident that most farmers who cultivate underutilised legumes are male , old, married with fairly large family size and had one form of education or the others. Majority preferred radio and extension agents as their means of getting information on underutilised legumes while access to radio and farmers' association was high. The respondents were however constrained by poor seed viability, poor yield and lack of good market. The educational attainment of the respondents influenced their means of getting information on the underutilised legumes in the study area. It is recommended that research institutes with mandates on grain legumes should endeavor to generate technologies on lesser legumes that are capable of enhancing yield, improving seed viability and grain quality.

REFERENCES

Ajayi, M.T (2003): Analysis of Mass Media Use by Farmers in Egbeda Local Government Area of Oyo State ,Nigeria. Journal of Extension Systems.1992:45-47pp

Amusat, A.S and Oyedokun, M.O (2018):Media Use Pattern of Fish Farmers in Oluyole Local Government Area, Oyo State, Nigeria. International Journal of Advance Agricultural Research 6 (1) 47-54pp

Amusat, A.S (2018): Effectiveness of Research Extension. Farmers Input linkage System on Maize production in Nigeria. Unpublished Phd Thesis, Department of Agricultural Extension and Rural Development, University of Ibadan.

Ani A.O, Undiandeye U.C and Anogie D.A (1997) .The role of mass media in agricultural information in Nigeria, Educational forum, 3 (1): 80-85

FAO (2015) : Information and communication technologies for sustainable agriculture. Retrieved 9 June 2016.

Karigidi, M (2018): Promoting neglected and underutilized crops for food security: accessed at https/www. Financial Nigeria .com on 26th January, 2019.

Minnar Gultzan (2017):www science direct. com/science/article. Assesed on 14,April,2018.

Ogunbodede, B.A (2012):Gene Interplay for Food Security and National Development ,Inaugural lecture on 11th ,May 2012 at Obafemi Awolowo University, Ile Ife.

Oladeji,J.O (2011):Farmers' perception of Agricultural Advertisement in Nigerian Newspaper in Ibadan municipality, Oyo State. Journal of Media and Communication Studies.Vol 3(3).97-98pp

Okigbo ,R.N and Anyaegbu,C.F (2021):Underutilised Plants of Africa . Journal of Biology and Nature.13(2) 35-36pp

RFID News (2009): Malaysia begins RFID-enable livestock tracking program" Retrieved 15 March 2013.

World Bank (2015): World Bank's E-sourcebook ICT in agriculture – connecting smallholder farmers to knowledge, networks and institutions" Retrieved 9 June, 2016.

Yahaya, M.K (2008): Development Communications, Lessons from Change and Social Engineering Projects:Kraft Books Ltd, Ibadan.

Yekini, O.T. and M.I. Oguntade (2014) : Training needs of women vegetable farmers in Akinyele Local Government Area of Oyo State. International Journal of Tropical Agriculture Research and Extension (17 (1): 38-44

Yekini, O.T., Ojeleye, O.O. and Ladigbolu, T.A. (2015): Use of coping strategies to manage risks encountered in farming activities of rural households in Saki Agricultural Zone of Oyo State. (Proceeding of the 20th Annual National Conference of the AESON (15 – 17, 2015) pg 147.