Acta Scientific AGRICULTURE (ISSN: 2581-365X)

Volume 6 Issue 7 July 2022

Research Article

Effect of Information Sources on Farmers' Rice Production Adoption of Sawah Eco-technology in Kwali Area Council, Abuja, Nigeria

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DOI: 10.31080/ASAG.2022.06.1153

Received: May 20, 2022

Published: June 07, 2022

Abstract

The study analyzed the effect of information sources on farmers' adoption of Sawah Eco-technology in rice production in Kwali Area Council, Abuja, Nigeria. A total number of eighty respondents were randomly selected. Data for the study were collected using a well-structured questionnaire and analyzed using descriptive statistics such as: mean score, frequency counts and percentages. The result revealed that 80.0% of the respondents in the study area were male with a greater proportion (58.8%) of them being between the ages of 41 - 60 years. Majority of the respondents (82.5%) were married and have household size (6-10 members) with (45.0%) having an annual income of N210,000 - N300,000 from farm sales. The main sources of information on Sawah Eco-technology in rice production in the study area is through a combination of co-farmers and extension agents (20.0%) as compared to extension agents alone (18.8%.). Majority of the respondents are willing to adopt the Sawah technology if they have sufficient information because of its high benefits as compared to the other methods of rice production they are used to. The major challenges perceived by the respondents are: (i) the capital-intensive nature of the technology (91.3), (ii) high cost of agro-inputs and labour (56.3%) and (iii) farmers/herdsmen conflict (92.5%).

Keywords: Information; Sawah Eco-Technology; Adoption and Rice

Introduction

Lack of adequate information may be partly responsible for low productivity among our esteemed farmers in Nigerian. Rural farmers are therefore, earnestly in need of timely and up-to-date agricultural information. This has been observed as a major challenge in spite of several research findings lying on the shelves of numerous research institutions, thereby hindering the availability of such vital resource and their application in rural, agricultural, social and industrial development [1]. According to Sennuga., *et al.* [2], an informed mind is an enriched mind and any one that is not informed will be deformed. Information is therefore, an essential element for individual growth and survival. People frequently spread it, drawing a variety of ambiguous meanings and interpretations. According to Ebisike., *et al*. [3], it is difficult to mention the word "information" without referring to someone; educated people comprehend information from a variety of perspectives. Information source, according to [4], is a medium in which knowledge and/or information is kept. To put it another way, it is something that contains and/or stores information.

Information is now widely recognized as a critical resource for the twenty-first century. It's been described as a creative simulation that transforms into new outputs and processes. Information is vital

to the survival of all human societies, implying that information is life. For objective decision making, proper identification and use of information sources are required. Individual and organizational functionality are also ensured by having awareness of and using suitable information. Information boosts the user's knowledge, reduces his level of ambiguity, or expands the variety of options open to information users. Sennuga., *et al*. [5] state that for information to be effective, it must be accurate, timely, and relevant. Extension staff, community libraries, radio, television, film shows, agricultural pamphlets, state government agricultural organizations, and other means are used to provide agricultural knowledge to rural farmers. Rural farmers, on the other hand, face significant obstacles in their efforts to get agricultural knowledge and information from available sources for better farming systems and increased agricultural productivity.

According to Aina [6], the lack of good service delivery services is the missing connection between research output and its utilization. The gap between known knowledge of improved technology and actual practice is enormous, and it has had a significant impact on efforts to increase food production. FAO, (2019) stated that Africa had a total production volume of 14.6 Million Metric Tonnes of rice with Nigeria producing about 55% and Egypt producing about 30% of this volume.

Rice is used for different purposes but mainly eaten as a staple food in Nigeria and other parts of Sub-Saharan Africa. The back of the rice called rice husk which is removed during the processing of rice is used in the livestock industry to produce feed. Production constraints in irrigated rice schemes include low nitrogen-use efficiency and iron toxicity, disease and pest pressure (especially birds), and low mechanization. Some of the socioeconomic constraints include a lack of involvement of farmers in the planning and implementation of irrigation schemes, lack of access to inputs (including credit), loss of labor and an aging farming population because of the effect of rural - urban migration. Rice yield in these schemes is 3.0-3.5 t/ha compared with the potential of 7-9 t/ha. In the rainfed lowland environment, rice cultivation is characterized by low yield ranging between 1.5-3.0 t/ha as against a potential yield of 3.0-6.0 t/ha. This is caused by suboptimal water management, inadequate weed management, and low adoption of modern varieties, low mechanization, pests and diseases pressure, and uncertain land tenure.

In the upland environment, rice cultivation is challenged by drought, low adoption of improved varieties, soil acidity and general soil infertility, poor weed control, limited capital investments and labor shortages, and low mechanization. Yields range from 1.0 to 1.7 t/ha compared with a potential of 2.0-4.0 t/ha.

For domestically grown rice to compete favorably with imported rice therefore, improvement in the area of production of the local rice is imperative. This informed the introduction and integration of sawah eco-technology for rice production in Nigeria. Sawah refers to man-made improved rice fields with delineated, leveled, bunded, and puddled rice fields with water intake and output, according to Fashola., *et al*. [7]. It's a type of irrigated farming technique that uses water from canals, ponds, and springs. As a result, the sawah system is the best alternative for addressing Nigeria's rice production challenges, which include poor soil fertility, inadequate water management, and poor varieties. The Sawah system takes advantage of the exceptionally fertile inland valleys (eco-technology). Fertility may be maintained to boost local rice production with proper water management of inland rivers, streams, and valleys [8].

The sawah system was first implemented in Nigeria in 1986 through on-farm adaptive research in the Gara and Gadza inland valleys in Bida, Nigeria [HIROSE, 2002]. In 2012, four Fadama groups in Birni Kebbi, Argungu, Bagudo, and Jega were introduced to Sawah in Kebbi State. Water pumps, power tillers, fertilizer, enhanced rice seeds, and herbicides were provided to these groups. Adoption of new agricultural technologies has become a crucial avenue for enhancing production in developing nations, according to Lai-Solarin., *et al*. [9]. Rogers [10] defined adoption as the mental process through which an individual goes from first hearing about an innovation to final adoption. An important component of adoption decision process is the understanding of the processes leading to the adoption of new technologies by farmers.

Ezike,., *et al*. [11] asserted that adoption studies have repeatedly stressed the importance of different farmer and farm variables in influencing whether or not such technologies will be adopted. However, a farmer's decision to embrace a technology is complicated and comprises two processes that are mutually exclusive: the first is opting to use the technology in the first place, and the second is deciding on the amount or intensity of use of the same technology.

Alarimi., *et al*. [12]; Rogers [10] opined that research has shown that a number of farm-household factors, such as the household head's age, education, and personal characteristics; the size, location, and tenure status of the farm; the availability of cash or credit for farm investment; and access to urban markets, are all linked to farmers' decisions.

Significance of the Study

It is hoped that this study will give information on the sources of agricultural information to our esteemed farmers in the study area and FCT in general. Additionally, the study will help rice farmers and policy makers in adoption and promotion of this cost-effective technology in rice production in FCT and Nigeria in general.

Objectives of the Study

The broad objective of the study is to analyse the effects of information sources in farmers' adoption of Sawah Eco-technology in Rice Production in Kwali Area Council of FCT.

Specifically, the study seeks to:

- Describe the socio-economic characteristics of the respondents in the study area.
- Ascertain the sources of information on Sawah Eco-Technology among rice farmers in Kwali Area Council.
- Assess the advantages of Sawah Eco-Technology in the production of rice in the study area.
- Identify some of the constraints in adoption of Sawah Eco-Technology in the production of rice in the study area.

Methodology

Description of the study area

The study was carried out in Kwali Area Council of the Federal Capital Territory (FCT), Nigeria. Kwali Area Council was created on October 1st, 1996; it is situated at the South-Western part of the FCT. It lies between latitude 8 and 9^0 South and longitude 78^0 East. The council has a total land mass of about 1,700 km square. The settlement pattern is dispersing with indigenous clustered type within Kwali, Yebu, Leda, Dangara, Sheda, Kilankwa, Dabi and Pai.

Kwali Area Council has a vast land conducive for Agricultural activities. The rich and fertile soil makes it suitable for cultivation of variety of crops with large spread of Fadama 'land' suitable for rice farming. It is irrigated by the two principal Rivers of FCT, namely Okai and Gurara. The main ethnic groups include Gwari, Ganangana, Bassa, Fulani and other tribes. The study area was purposely selected because Kwali is one of the major rice cultivating areas in FCT. From four selected wards out of ten wards that constitute Kwali Area Council, 20 respondents were further randomly selected from one community each from the selected four wards. This gives a total number of 80 respondents (n = 80).

The instrument for data collection was a questionnaire administered to the rice farmers. It consists of socio-economic characteristics, sources of information on Sawah-Rice production technology and benefits of Sawah Eco-technology in rice production in the study area.

Data analysis

The primary data collected was analyzed using the Statistical Package for Social Sciences (SPSS) to generate production percentages and frequency distribution etc.

Results and Discussion

Sex	Frequency	Percent
Male	64	80.0
Female	16	20.0
Age		
20-30 years	12	15.0
31-40 years	17	21.3
41-50 years	27	33.8
51-60 years	20	25.0
61-70 years	3	3.8
No response	1	1.3
Marital status		
Married	66	82.5
Single	9	11.3
Widowed	2	2.5
Divorced	2	2.5
999	1	1.3
Household size		
0-5	28	35.0
6-10	31	38.8
11-15	20	25.0
No response	1	1.3

Educational qualification		
FSLC	41	51.2
SSCE	23	28.7
NCE/OND	10	12.5
B.SC/HND	5	6.3
No response	1	1.3
Major occupation		
Crop farmer	76	95.0
Livestock farmer	1	1.3
Trader/businessman	1	1.3
Private/public worker	1	1.3
No response	1	1.3
Type of crop do you cultivate		
Cereal	79	98.8
No response	1	1.3
Farm size		
0-0.5ha	1	1.3
0.5-1ha	69	86.3
1.2ha-3ha	9	11.3
No response	1	1.3
Yield per production cycle (in bags)		
10-15 bags	2	2.5
20-30 bags	66	82.5
Above 50 bags	11	13.8
No response	1	1.3
Annual income from farm	Frequency	Percent
101,000 - 200,000	2	2.5
201,000 - 300,000	36	45.0
301,000 - 400,000	20	25.0
401,000 above	21	26.3
No response	1	1.3

Table 1: Socio-economic characteristics of the respondents in the study area.

Source: Field Survey, 2021.

Data in table 1 shows that majority (80.0%) of the respondents in the study area were male with greater proportions (58.8%) of them being between 41-60 years of age. This age bracket according to Obinne (1991) is an advantage for increased investment and improved technology utilization and hence innovativeness. This is also in line with the findings of Sennuga,., *et al* [2] that this age brackets were within economic active age and this enhances their productivity in order to be food secured. Majority of the respondents (82.5%) were married and have a household size (6 - 10members) of 38.8% and an annual income from sales of ₦210, 000. 00 - ₦300, 000.00 (45.0%). The implication of this finding is that more family labour and little excess income will be available as these factors constitute major hindrances to adoption of most modern technologies extended to our rural farmers.

Educationally, 51.2% of the respondents in the study area had acquired first school leaving certificates while 28.7% had secondary education. This is in line with the findings of Sennuga., *et al* [2] that the basic education required for better understanding and ability to embrace new technologies especially the adoption of GAPs (Sawah Eco-Technology inclusive) modern farming technology.

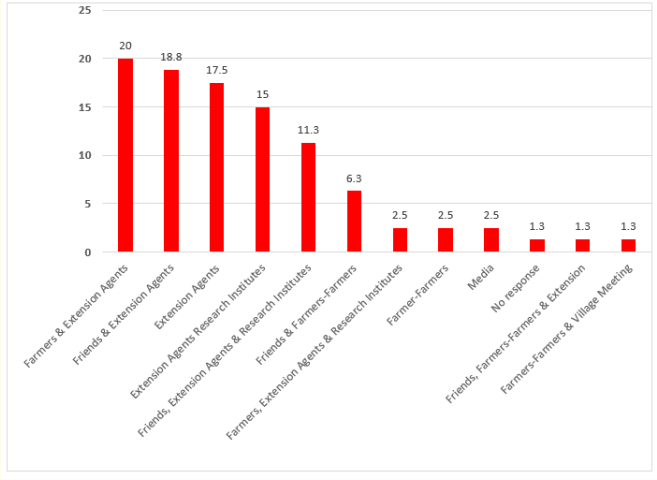

Figure 1: Sources of Information on Sawah Eco-Technology in Rice Production.

Source: Field Survey, 2021.

Figure 1 shows that the combined major sources of information on Sawah Eco-Technology among the respondents in the study area are co-farmers and extension agents (20.0%), closely followed by friend and extension agent (18.8%) while information from extension agent alone is 17.5%. Similarly, a combination

of information sources from extension agents and research institutions constitute only 15.0%. From the forgoing analysis, it can be deduced that the respondents were not receiving much extension support as necessary. This does not augur well for innovation adoption and transfer as pointed out by the finding of Agwu., *et al*. (2008). The table further shows that media as a source of information has not made much impact among the respondents in the study area. This may be due to negligence on the part of the agency concerned not including the use of media in the dissemination of information on Sawah Eco-technology in rice production within the study area.

Water Availability	Percent
Agree	98.8
Not agree	1.3
Avoid Draught	
Agree	98.8
Not agree	1.3
Weed Control	
Agree	98.8
Not agree	1.3
Water Management	
Agree	98.8
Not agree	1.3
High Yield	
Agree	98.8
Not agree	1.3

Table 2: Benefits of Sawah Eco-Technology in Rice Production.

Source: Field Survey, 2021.

98.8% of the respondents of the study area strongly agreed that Sawah Eco-technology in rice production offer the following advantages:

- Water availability for the crop as at when needed.
- Avoid draught
- Control weeds
- Provides ability for good water management
- Increase rice yield.

These benefits are consistent with the findings of Fashola., *et al*. [7], who found that the Sawah approach offers low-cost irrigation and water control for rice intensification with sustainable paddy yields of more than 4 tons per hectare but with improved agronomic practices, such as the rice intensification system with the Sawah technology, paddy yields can reach more than 10 tons per hectare. Sawah, according to Oladele., *et al*. (2008), solves soil fertility concerns by improving geological fertilization and conserving water resources.

	Frequency	Percent
Intended	58	72.5
Do not Intended	22	27.5
Total	80	100.0

Table 3: Do you intend to adopt this technology if you have more information?.

Source: Field Survey, 2021.

72.5% of the respondents intend to adopt the use of Sawah in their production of rice if more information is available. This may be due to high rate of awareness of the advantages of Sawah Technology as compared to traditional methods they are used to, other factors being equal.

Lack of Capital	Frequency	Percent
Very high	73	91.3
High	6	7.5
No response	1	1.3
High cost of Agro Input		
Very high	63	78.8
High	16	20.0
No response	1	1.3
Lack of Perennial River/Stream		
Very high	29	36.3
High	37	46.3
Moderately high	13	16.3
No response	1	1.3
High labor Cost		
Very high	45	56.3
High	30	37.5
Moderately high	1	1.3
No response	4	5.0

Inadequate Information		
Very high	34	42.5
High	35	43.8
Moderately high	10	12.5
No response	1	1.3
Herdsmen/Farmers Conflict		
Very high	74	92.5
High	5	6.3
No response	1	1.3
Insecurity		
Very high	1	1.3
Moderately high	12	15.0
Low	35	43.8
Not at all	31	38.8
No response	1	1.3

Table 4: Extent of following factors constitute constraint to adoption of Sawah Tech in Rice Production in Kwali Area Council. Source: Field Survey, 2021.

On the perception of the extent to which some factors constitute a constraint to adoption of Sawah Eco-Technology is rice production, 91.3% believe that Sawah is capital intensive, 78.8% opined that high cost of agro inputs is the major factor, and 56.3% of the respondents opined that labour may constitute a major factor. However, majority of the respondents in the study area believe herdsmen/farmers conflicts constitute 92.5% extent as factors to adoption of Sawah technology in rice production in Kwali Area council.

This study is closely in agreement with the findings of Egbe., *et al.* [13] that several farm-household factors, including the household head's age, education, and personal characteristics; the size, location, and tenure status of the farm; the availability of cash or credit for farm investment; and access to urban markets, were all linked to the farmer's decision (adoption or rejection of new innovations/technologies) [14-17].

Conclusion/Recommendations

Information has been regarded as a source of inspiration for new ideas and methods. All human societies rely heavily on information to survive, and information is life. The study revealed that the major sources of information on Sawah Eco-technology in rice production in the study area are co-farmer and extension agent combined (20.0%) while extension agent alone is 17.5% indicating there is low farmer - extension agent contact. The study also revealed that the respondents are aware of the benefits of using Sawah Technology (98.8%) as compared to their other methods of rice production with 72.5% of them intend to adopt the use of this technology if they have more information.

Finally, capital, high cost of agro-inputs and herdsmen/farmers conflicts constitute factors hindering the adoption of Sawah Eco-technology in rice production in the study area.

Based on the finding of the study, the following recommendations are made:

- There is need to increase rate of contact between the farmer and extension agent by training the newly recruited N-Power beneficiaries into Agricultural extension services of FCT-ADP
- FCT Administration should strengthen the use of ICTs among extension agents for information dissemination to farmers.
- More information should be made available to the farmers on use of Sawah Eco-technology in production of irrigated crops like rice, maize and sugar cane by relevant research institutions.
- Farmers' friendly sources of finance from private individuals, BOA, and other commercial bank should be encouraged by the policy maker.
- Subsidizing of agro-input by government as still obtained in other developing nations of the world.

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