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Influence of Socio-economic characteristics of irrigation farmers to access and utilization of agricultural knowledge and information.

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Abstract:

The study investigated the influence of socio-economic characteristics of irrigation farmer's access to and utilization of agricultural information in North Western Nigeria. A questionnaire survey of 368 households in three (3) states in North Western Nigeria was used. The objectives of the study is: To identify the extent to which some socio-economic variables of irrigation farmers affects their utilization of agricultural information; to highlight how the socio-economic variables could help in determining the type of information needed. Using the Diffusion of Innovation paradigm of Rogers, multiple regression, correlation coefficient and Chi-square analysis, the results of the study suggest that age, sex, experience, educational status and belonging to farmers association have significant relationship on access to and utilization of agricultural information by the irrigation farmers. However, a critical gap still needs to be filled by the research extension services in combining the technical and socio-economics aspects of irrigation farming in order to boost the country's food production and food security.

Key words: Access, Information, Knowledge, Utilization, Adopters, socio-economic

Introduction:

Farming and particularly irrigation farming, has a long history of being studied as a physical process by scientist, agronomist, geologist, geographers and engineers. With access to ICT facilities, many such researchers were able to utilize these facilities to predict the future of agriculture. The importance of irrigation farming to the national economy cannot be overemphasized, as it has become popular industry for the small holders that have great contribution to the economy of the country. The profession has assumed greater importance in improving employment opportunity, wealth creation and food production in Nigeria. Thus, it has long been identified that focusing on physical process offers only a supplementary explanation of the causes of lack of access to and utilisation of agricultural knowledge and information by the irrigation farmers. Irrigation farmers' decision with regards to provision, adoption of innovation, access to and utilization of information are critical to farming. Thus, in agricultural information use studies, it is usual and paramount to investigate the personal and social characteristics of farmers in order to understand their relative influence in the farmers' information use behaviour (Opara, 2010). This may be because information use is dependent upon the capacity and ability of the user to access and utilized the information provided.

Hence, socio-economic, cultural, personal and geographical variables are some of the factors predicting the capacity and ability to use the agricultural knowledge and information by the irrigation farmers. Other factors that enhances the use and utilization of information by the irrigation farmers include among others, timely and appropriate information, credibility of the channels of information and the information provider characteristics.

The decisions of the irrigation farmers are not only determined by factors relating to the farm and its management but also by exogenous institutions and socio-economic factors. So there is the need to identify those factors beyond just farm finances, institutional and farmers' characteristics that explain access and utilisation (Prager & Posthous, 2010). At its simplest, any agricultural scientist will recognize the role played by information channels in providing access to and utilisation of agricultural information, and it is quite apparent that this factor is strongly

influenced by irrigation farmers who are responding to socio-economic factors. The question that arises is, why do policy makers and extension workers allowed irrigation farming to be in a vulnerable state despite its economic importance to the society? Is it because of lack of interest in irrigation farming or are the socio-economic factors not encouraging policy makers to take the risk of helping farmers whatever the odds or circumstances?

Objective of the study: To identify the extent to which some socio-economic variables of irrigation farmers affects their utilisation of agricultural information; to highlight how the socio-economic variables could help in determining the type of information needed and to identify the implication of the findings for future action by all stake holders in irrigation farming.

According to Boardman *et al.* (2003) of all the factors that influenced farmers in developed world, socio-economic incentives are ranked high. This may be possible because farmers react very quickly to changes in price incentives and within the topography, soils, rainfall, access to market price and quota arrangement. Also, Boardman *et al.*(2003) were of the view that in many countries, the important move away from mixed farming with livestock and grass, and into predominantly arable system, is driven by socio-economic factors operating both at a national and local scale.

Analysing the socio-economic characteristics of the irrigation farmers is essential to develop an appropriate method of transfer of agricultural knowledge and information and also, to analyse the information system used by the irrigation farmers. The age of the irrigation farmers, their educational background, farming experience, land acquisition and sources of capital are all significant (Atala, 1984, Adesina & Kehinde, 2008 and Umar, 2002). Stocking & Murnaghan (2001) discuss the factors affecting land users and land degradation. They listed some socio-economic factors that are influenced by economic incentives than any others. These factors among others include land tenure and capital. A study by Adebayo & Adeola (2005) on socio-economic factors affecting poultry farmers in Ejigbo Local Government Area of Osun State reveals that educational level of farmers had positive and significant relationship with average production. However, the significant relationship between educational level and average production could be due to sound knowledge and efficient management required of poultry farmers to ensure profitability in poultry business.

This study attempt to examine the influence of socio-economic characteristics of irrigation farmers towards access and utilization of agricultural information. These socio-economic factors

may influence the nature of the information system which shows the information contact and information sources from which irrigation farmers benefit. In this type of study, the Diffusion of information paradigm of Rogers (1995) was used. This became apparent because access to and utilisation of information is the constituents in determining adoption decisions of the irrigation farmers. The strength of the DOI is a multifaceted process of using information. In this study we noted that there are several ways in which an irrigation farmer access, adopt and utilize information.

Diffusion of Innovation Theory

According to Rogers (1995), diffusion is the process by which an innovation is communicated through certain channels over time among the members of a social system. It is a special type of communication in that the messages are concerned with new ideas. Diffusion is a kind of social change, defined as the process by which alteration occurs in the structure and function of a social system. New ideas are invented, diffused, and are adopted or rejected, leading to certain consequences and social change. There are four main elements in the diffusion of innovation: innovation, communication channels, time and the social change. This study is however motivated by the innovation aspect.

Innovation: This is an idea, practice or object that is perceived as new by an individual or other unit of adoption. It matters little in so far as human behaviour is concerned or whether or not an idea is objectively new as measured by the lapse of time since its first use or discovery. Someone may have known about an innovation for some time, but not yet developed a favourable or unfavourable attitude toward it, nor has he/she adopted or rejected it either (Rogers, 1995).

The innovators are highly educated and have multiple information sources. They are also risk-takers and pioneers who lead the way. They are ready to bear the risk associated with uncertainty. The early adopters are popular and educated, social/opinion leaders in their social systems. They help spread information about the innovation to others. These constitute the large scale farmers, particularly the irrigation farmers. The third category is the early majority. They are careful adopters who do not like to take risks like the two earlier categories, but they wait to ensure acceptability before adopting the information. They are therefore mostly followers. The other categories are the late majority and the laggards. The late majority waits to make sure that

adoption is in their best interests before accepting the information. They are mostly of low income status, hence, they are not ready to adopt until they are sure of the cost analysis of the innovation from the early adopters. The laggard group constitutes individuals who are extremely skeptical and resist adopting until it becomes absolutely necessary (Rogers, 1995). Therefore, in this study, we should consider that because of the socio-economic status of most African farmers and especially Nigerian farmers, majority of the irrigation farmers belonged to the late majority and laggard group. These can be observed from their background as depicted below.

Background and Demographic Characteristics of the Respondents (irrigation farmers)

The researcher believes that the background and demographic characteristics of the respondents should be considered so as to know essential information about the population being studied. This includes gender, age, ethnicity and language and employment status. According to Atala (1984), there is a relationship between socio-economic variables of farmers and adoption of agricultural innovations. Gender as a socio-economic variable assists a researcher to analyze the role, responsibilities, constraints and opportunities for both males and females (Umar, 2012).

The age of a respondent is also a determiner in his ability to think, act and adopt innovation. This could be attributed to the fact that irrigation farming belongs to the older people, who in one way or the other have retired from trading or menial jobs. Umar (2013) asserted that irrigation farmers who are in the age bracket of 55 and above were more responsible and possess the experience required for better yields.

Another socio-economic factor is the marital status of the farmers. Marital status has an important implication on the irrigation farmer's productivity. A married farmer is more likely to have a bigger household than others, hence the need to provide more food as required by the household. By providing more food it technically translates to more information needs and access.

Education is globally considered a vital tool for combating poverty. The adoption of improved agricultural technologies and embracing of new development projects are significantly affected by educational attainment. The irrigation farmers' level of education is an important factor that determines their ability to understand policies or programmes that affect farming

(Adesina & Kehinde, 2008). According to Umar (2012), this category of literate farmers will probably be more productive because their level of education will enable them to make inquiries as regards new innovations in farming. Due to their level of education and exposure, their farm produce could be much better compared to others with lower levels of education. Also, other colleagues could go to them for advice and information because they are among the early adopters of innovation since they are highly educated.

To a large extent, the years of experience of a farmer affects his managerial ability to take decisions. Experience enables the farmer to set realistic goals and means of achieving them. It should therefore be noted that experience goes with the number of farming years accumulated. In other words, the number of years an irrigation farmer has put into practice will enable him to gain more experience. This suggests that the more experience one has, the more likely one will have more farm produce and the more one adopts innovations introduced by policy makers and researchers. Table 1 below shows the frequency distributions of gender, age, marital status, educational qualifications as well as farming experience of the irrigation farmers.

Table 1: Demographic characteristics of the irrigation farmers

Gender	Male 368 (100%)	Female 0	Nil	Nil	Nil	368 (100%)
Age	141(38.2%) 55 and above	48 (13.0%) 45-54 years	24 (6.5%) 36-44 years	24 (6.5%) 25-35 years	Nil	237 (64.2%)
Marital status	Married. 191(51.8%)	Single 46(12.5%)	Divorcee 0	Widower 0	Nil	237 (64.3%)
Educational qualification	Non-formal 24 (6.5%)	Primary School 236 (64.1%)	O'level 48 (13.0%)	ND/NCE 24 (6.5.0%)	B. Sc. /HND 24 (6.5%)	356 (96.7%)
Farming experience	10 and 15 years 185 (50.3%)	15 and above 53 (14.4%)	6 and 10 years 92 (25.0%)	1 and 5 yrs. 38(10.3%)	Nil	368 (100%)

Background Information of Irrigation Farmers

In this study, background information about the farmers refers to basic information such as the general description of either being small or large scale; how they acquire their land and their sources of capital. In this section, the following background information is discussed.

- Types of farming practised
- Land acquisition
- Sources of capital.

Types of Farming Practised by the Irrigation Farmers

This section deals with the type of irrigation farming in which the farmers are engaged. There are three main types of irrigation farming: subsistence, large scale and commercial farming. Subsistence is the one where farmers engage for their sustenance, that is, for their consumption and to sell so as to take care of their daily needs. The large scale type is the one in which farmers have large farms using machinery like tractors, threshers and ploughs to produce in large quantities not only for own consumption, but also to sell. Commercial farmers are those who produce for the purpose of selling to middle men and companies. Figure 1 below shows the responses of the farmers on the type of irrigation farming they practised.

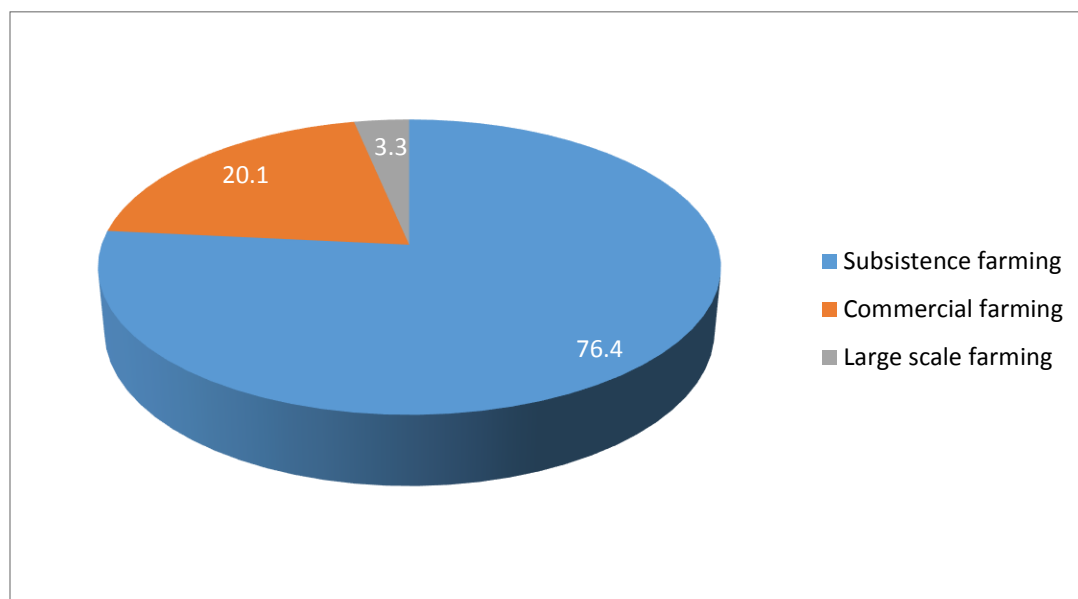


Figure 1: Types of farming practised

Figure 1 shows that 286 (76.4%) respondents, practised subsistence farming, 74 (20.1%) participated in commercial farming while 12 (3.3%) practiced large scale farming.

Land Acquisition by Irrigation Farmers

Table 2 shows how the respondents acquired the land they cultivate. A total of 249 (67.7%) respondents indicated that they inherited the land from their parents, 36 (9.8%) purchased the land from colleagues, whereas 83 (22.5%) respondents indicated that the government allocated them the land. Normally, government can allocate land to people, especially, the information gatekeepers or Sarkin Rafi as they are known and called in Hausa. The Sarkin Rafi is usually allocated lands that are close to dams or canals. For reasons of their proximity to the canals, the Sarkin Rafi usually enjoys the advantage of using water before any other farmer.

Table 2: Land Acquisition

Land Acquisition	Frequency	Percent
Inheritance	249	67.7
Purchase	36	9.8
Government Allocations	83	22.5
Total	368	100

Sources of Capital

Table 3 explains the respondents' sources of capital they invested in farming. In this study, 155 (42.1%) respondents indicated that they used personal savings, 117 (31.8%) got loans from the bank and 48 (13.0%) respondents got their capital through money lenders. Another 48 (13.0%) respondents indicated that they got their capital through farmers' cooperative societies. In addition to loans, they also got seeds and other inputs from the said cooperative societies. A

cooperative is a type of scheme in which each farmer would be saving some money for a given period.

Table 3: Sources of capital

Sources of capital	Frequency	Percent
Personal savings	155	42.1
Loans	117	31.8
Money lenders	48	13.043
Cooperatives	48	13.043
Total	368	100

Table 4 below explains the comparison between the socio-economic characteristics of irrigation farmers. The study reveals a significant relationship between the factors. The findings are significant in this study in that becoming literate, experienced and with bigger or large pieces of land with a very sound source of capital would enable the irrigation farmers to utilize research, extension, and education and support services more than those without such opportunities. This also explains why there exists a gap in information contact and utilisation of information through the various sources identified.

Table 4: Comparison of the socioeconomic characteristics of the irrigation farmers

Variables	Mean	Std. deviation	Std. deviation error mean	Student 't' test
Age of the irrigation farmer	4.0886	1.38261	.08981	**
Educational qualification	3.0674	0.85971	.04556	**
Farming experience	2.8034	0.70058	.03713	**
Land acquisition	2.0000	1.64739	.08588	**
Sources of capital	1.9701	1.03701	.05406	**

The relationship between total information score and some selected socio-economic characteristics was also explored. Partial correlation coefficient between these variables (controlled by agricultural information needs of irrigation farmers) was conducted to answer the question: do irrigation farmers with higher socio-economic status benefit from more information than those without? This study reveals a positive and relatively higher correlation between some socio-economic variables with information sources and usefulness. Table 5 below explains the correlation between some socio-economic variables with total information score.

Table 5: Correlation of socio-economic variables and total information scores

Variables	Information contact. Correlation value ®	Information sources Correlation value ®	Usefulness of information. Correlation value ®
Age of irrigation farmer	Nil	.053	-0.0184
Educational qualification	Nil	-.510	.066
Farming experience	Nil	Nil	Nil
Land acquisition	Nil	Nil	Nil
Sources of capital	Nil	-.217	.184

Membership to Irrigation Farmers' Associations

Below is a description of membership to associations of the irrigation farmers and the type of association they belonged to. The survey showed that the highest score of 334 (90.5%) respondents marked 'YES', meaning that they belonged to an association. On the other hand, 22 (6.0%) respondents marked 'NO'. This indicates that the idea of belonging to associations in furtherance of their farming business is popular among the irrigation farmers. From the interviews, it was revealed that irrigation farmers had associations and that they floated them in

order to benefit from government interventions. The findings show that 216 (58.5%) respondents indicated that they belonged to the Fadama Water Users' Association, while 99 (26.8%) respondents indicated that they belonged to the Wheat and Rice Producers' Association. Recently a report carried by the *Daily Trust Newspaper* (2014) indicated that a group of rice farmers at one of the schemes produced 61,000 tons of rice in the 2013 irrigation farming season. This indicates that membership to associations helps greatly in having a big yield. Also, 14 (3.7%) respondents indicated that they belonged to Perishable Produce Farmers' Association. The other 39 (10.5%) respondents indicated that they belonged to the Beverages Farmers' Association.

Belonging to an association played a significant role in any farming business. This is because it was through the associations that government gets to know the number of registered farmers. From the documents available at the irrigation sites, the researcher observed a long list of fertilizer beneficiaries based on their associations. This knowledge aids government in distributing fertilizers, hybrid inputs and sharing water to each irrigation farmer (Umar, 2012). The irrigation farmers were also asked whether they benefitted from being members of any of the irrigation farmers' associations. The survey showed that 316 (96.1%) respondents indicated that they benefitted a lot from being members of an association. For example, they have access to inputs, water and fertilizers at cheaper rates or give away prices. Also, 13 (3.9%) respondents indicated that they had access to market information. This was possible largely because of their participation as members of associations.

Communication Channels

From the cross tabulation made, communication channels had a significant relationship with access to agricultural knowledge and information needed for irrigation farming. Without a proper communication channel, irrigation farmers would not be able to access and utilize information generated. To a large extent, literacy levels of irrigation farmers determined the communication channels they used to retrieve and share information. This premise was justified when educational qualifications of irrigation farmers were cross tabulated with communication channels used in retrieving and sharing information as shown in the Table below. The table shows the cross tabulation made between educational qualifications of irrigation farmers with the

communication methods they used in sharing information. The result indicates that Pearson Chi square value is 35.896. The degree of freedom (df) is 32 and the Asymp. Sig (2-sided) is .291. The likelihood ratio value is 33.170, while the linear-by-linear association value is .293. The results from the cross tabulation show that the Chi-square (χ^2) value is greater than .05. This indicates that educational qualification of irrigation farmers determines their level of sharing agricultural information. It also implies that there is a significant relationship between the levels of education of the irrigation farmer with his/her usage of communication methods in sharing information.

Table 6: Communication methods used for sharing information

Educational qualification	Drama	Stories	Posters	Training and visits	Library	Word of mouth	Radio	Television	TV&radio	Total	Chi – square value
None formal	0 (0.0%)	1(4.2%)	7(29.2%)	5(20.8%)	2(8.3%)	3(12.5%)	5(20.8%)	0(0.0%)	1(4.2%)	24	
Primary	1(4.3%)	0 (0.0%)	10(43.5%)	6(26.1%)	3(13.0%)	1(4.3%)	1(4.3%)		1(4.%)	23	
O/Level	7(3.0%)	2(0.8%)	103(43.6%)	68(28.8%)	9(3.8%)	25(10.6%)	16(6.8%)	2(0.8%)	4(1.7%)	236	
ND/NCE	3(6.5%)	0(0.0%)	19(41.3%)	10(21.7%)	4(8.7%)	3(6.5%)	5(10.9%)	1(2.2%)	1(2.2%)	46	
BSc/HND	3(13.0%)	0(0.0%)	6(26.1%)	5(21.7%)	0 (0.0%)	3(13.0%)	5(21.7%)	0(0.0%)	1(4.3%)	23	
Total	14(4.0%)	3(0.9%)	145(41.2%)	94(26.7%)	18(5.1%)	35(9.9%)	32(9.1%)	3(0.9%)	8(2.3%)	352	X²=35.896

Factors that hinder access and utilisation of information resources by the irrigation farmers

From the cross tabulation made between educational qualifications of irrigation farmers and the challenges of agricultural knowledge and information support systems, Table 8 below provides an explanation that there exists a significant relationship between the educational level of an irrigation farmer and the challenges he/she faced in the retrieval and dissemination of information. The cross tabulation showed that the Pearson Chi square value is (287.365), the p-value is (46.194), the likelihood ratio value is 318.415, the degree of freedom (df) is 32, while the Asymp. Sig. (2-sided) is .000. Thus, this indicates that χ^2 value is greater than .05 and therefore there is a significant relationship between educational qualification of the irrigation farmer and the challenges they face in accessing and utilizing information. The cross tabulated table is presented below.

Table 8: Challenges of knowledge and information retrieval and dissemination

Educational Qualification	Delay in information dissemination	High technicality of information	In adequate extension workers	Lack of ICT materials	Lack of training and visits	Language	Total	Chi-square value
Non formal	0(0.0%)	0(0.0%)	14(58.3%)	1(4.2%)	1(4.2%)	8(30.4%)	24(100%)	
Primary	0(0.0%)	0(0.0%)	0(0.0%)	0(0.0%)	24(100%)	0(0.0%)	24(100%)	
O'level	2(0.8%)	42(17.8%)	94(39.8%)	27(11.4%)	26(10.2%)	45(19.0%)	236(100%)	
ND/NC	0(0.0%)	0(0.0%)	0(0.0%)	0(0.0%)	48(100%)	0(0.0%)	48(100%)	
BSc/HND	0(0.0%)	0(0.0%)	0(0.0%)	0(0.0%)	24(100%)	0(0.0%)	24(100%)	
Total	2(0.6%)	42(11.8%)	108(30.3%)	28(7.9%)	123(33.7%)	53(15.7%)	356(100%)	X²=287.365

Summary and implications

The findings revealed that four distinct features are apparent for accessing, adopting and utilizing information by the irrigation farmers as a results of their socio-economic characteristics:

- (1) An individual farmer adopting, accessing and utilizing information based on his initiative and his socio-economic background (Innovators).
- (2) An individual farmer access, adopt and utilize information based on his own volition and until he waits to ensure acceptability of the information by others before he adopt, access and utilized the information (early adopters).
- (3) The late majority who waits to make sure that adoption is in their best interest before accepting the information and these are mostly low income farmers (the late majority).
- (4) The laggards constitutes individual farmers who are extremely skeptical and resist adopting innovation until it becomes absolutely necessary.

In any case a mixture of these features may apply in determining the socio-economic factors that play a greater role in access to and utilisation of information by the farmers. An irrigation farmer may consciously or unconsciously decide to belong to any of the above distinct features. However, the main focus is on how best socio-economic factors could influence irrigation farmers' access and utilisation of information. This study established that these factors influenced and play a greater role in access, adoption and utilisation of information resources by irrigation farmers in the study area. Therefore, for policy makers and implementers to achieve and influence irrigation farmers to accept and adopt innovation, there is the greater need to study the socio-economic characteristics of the farmers. These would enable irrigation farmers to have access, adopt and utilized agricultural knowledge and information.

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