Cooperative Societies and Technology Adoption in Southwest Nigeria

(A Study of Selected Agricultural Cooperatives)

A Paper Presented at the 1st International Conference of the Federal Polytechnic Ilaro between 5th and 8th November, 2018.

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Abstract

Agricultural Cooperatives have been operating in various areas of the Nigeria economy to improve livelihood of their members and the economy at large. The aim of the study is to examine the impact of agricultural cooperative society on technology adoption in Southwest Nigeria. The population of the study consisted of all members of Agricultural Cooperatives Society in the study area. A survey research design was employed for the study. Multi-stage sampling technique was adopted to select five hundred and forty (540) respondents; 3 local government areas were selected randomly in each of the states in the southwest Nigeria representing the study area, while 5 agricultural cooperatives society were subsequently selected in each of these 18 Local Government area and finally, 6 cooperative members were selected purposively in each of the 90 cooperative societies. The relevant data were collected through questionnaires consisting 2 scales tagged technology adoption scale and members predilection scale. Data were analyzed using descriptive statistics and simple linear regression with the aid of SPSS. The result of the analyses revealed a positive and significant effect of cooperative membership on technology adoption. This was evidenced by the value of the correlation coefficient (**β**=.636, t=8 648, p<.05) and R^2 =.404. It was therefore recommended that agricultural cooperative society should be supported through funding as well as link up with source of inputs and extension services.

Keywords:*Adoption, Agricultural, Cooperatives, Influence, Technology.*

1.0 INTODUCTION

One of the most significant challenge that developing economies have to face relates to attainment of economic growth in key economic sectors (Siyanbola, Egbetokun, Oluseyi, Olamade, Aderemi, & Sanni, 2012).This growth, if attained trickle down to other sector of the economy and bring development. The desired growth may not be achieved without the application of appropriate technology to the different sector of the economy. Technology can be defined as the harmonious application of organized and scientific and socio-cultural know-how to manipulate the environment with the intention of solving problems and satisfy human need. At its most basic level, technology is defined as the application of knowledge to provide solutions to problems, mostly of mankind (Siyanbola, Egbetokun, Oluseyi, Olamade, Aderemi, & Sanni, 2012). The required technology is either achieved through development of indigenous technology or transferred foreign technology; creation of new technology through innovation is also relevant in this regard. Unfortunately these three categories (indigenous, foreign technology and new technology)seem elusive in Nigeria's case. She has neither been able to develop her indigenous technology nor adequately acquired the available foreign technology due to numerous challenges. This buttresses the fact that the involvement of developing countries in producing new technologies and innovations is almost negligible (UN, 2005).

Apart from the need for government commitment through the provision of infrastructure, funding and acquisition of the available technology, lack of brokerage organization and business sectors remains an importantchallenge faced in adoption of technology in Nigeria.

However, cooperatives societies perhaps may serve as brokerage organization to facilitate the adoption of the necessary technology. This could be done through funding, acquiring, creation of awareness, capacity development, and motivation of people toward technology adoption etc.

Cooperative societies are widely regarded as an important institutional innovation that can help overcome the constraints that impede access to, and adoption of improved technology (Wossen, Abdoulaye, Alene,. Haile, Shiferaw, Olarenwaju, & Victor, 2017). In this new economic order, developing nations can no longer compete based only on their natural resource endowments and location advantages. For a nation to withstand competition in this era of globalization there is need for such to identify its niche areas and build on it by the application of appropriate scientific methods technology(Siyanbola, Egbetokun, Oluseyi, Olamade, Aderemi, & Sanni, 2012)When talking of innovation in a less developed economy like Nigeria,(UNCTAD, (2007)noted that it matters much more for countries to focus on the adaptation, diffusion and upgrading of technologies that already exist rather than pushing (or even attempting to push) the global knowledge frontier further (Siyanbola, Egbetokun, Oluseyi, Olamade, Aderemi, & Sanni, 2012).

1.2 STATEMENT OF THE PROBLEM

It has been established by previous studies that both economic growth and development are product of technology advancements. In fact, no nation develops without correct and adequate application of modern technology. Advancement in technology is facilitated by the combination of three crucial efforts which include development of indigenous technology, creation of new technology and transfer of foreign technology. Nigeria case in these regards is particularly sobering; she has not been able to improve her numerous indigenous technology nor create new ones, and the available foreign technologies have been almost elusive and not correctly nor adequately adopted due to various constraints among which are lack of facilitatory institution, credit-market, capacity development and imperfect-market information (Shiferaw et al. 2008; Suri, 2011; Wossen et al. 2015).Apart from slow adoption rate of few accessible improved technology, it is rather disappointing that improper identification of the main barriers of adoption remain a challenge (Solomon et al. 2010; Wossen et al. 2015; Shiferaw et al.2008) cited in (Wossen et al. 2017)

However, addressing the issue of facilitatory institution (whose attributes can be found in cooperative societies) could serve as an entry point for acceleration of adoption of modern technologies.

To this end, this study seeks to examine the impacts of cooperative society on technology adoption and would in effect test the following hypothesis

Ho: Cooperative society membership does not have significant effects on technology adoption.

2.0 LITERATURE REVIEW

2.1 Conceptual Review

Meaning of Cooperative: A cooperative is an enterprise in which individuals voluntarily organize to provide themselves and others with goods and services via democratic control and for mutual shared benefit. Members generally contribute to and control via democratic process (King, 2017). Over the years, the cooperative form has extended to credit unions, wholesale and/or retail consumer group, residential organization, producer enterprises, and market associations(King, 2017).

Benefits of Cooperative Society: Certain broadly defined economic advantages accompany cooperative society; (King, 2017) researchers have devoted substantial amount of analysis to such benefit as:(1)development of savings culture- which may not be as effective with other methods. Cooperatives are regimented, that once you save you cannot withdraw your money except you are terminating your membership. (2) The ease of getting credit-since cooperative act like is just temporary warehousing money to be disbursed (King, 2017). (3) Platform to network with a cooperative society-members have alliance with colleague from all walks of life.(4) Dividend, payment- this depends on what has been saved; members are paid dividend as compensation for savings.(5)Property acquisition- in this area cooperative assist such process in ease of payments and

other benefits attached to being a member.(Osunremi, 2018). (6) Horizontal monitoring- this eliminate unnecessary supervision. (7) Superior productivity rate-that results from the extension of democratic principles in cooperative workplace.(8) Cooperative power-There are some things that a corporate body can achieve easily, which are rear impossible for an individual.(9)Expertise and knowledge acquisition- The individual participates in the running of the business of the group, and in the process acquire knowledge and expertise which can be beneficial in his personal affairs (Komolafe, 2013).(10)Affordable finance- Financial cooperatives such as credit unions offer sustainable finance for local people excluded from the traditional banking system, the cost of such funds are usually low. (11) Empowerments of marginalize group- As open and democratic organization, cooperative foster gender equality, apart from having women in senior positions in cooperatives, a significant number of them are established by women(Sharethebenefit, 2015).

Nature of Cooperative: Cooperative organization are more inclined family spirit, this understanding promotes stronger cohesiveness among members. Cooperative society is a form of togetherness, openness and mutual trust in which every member involved in the management and shared a common sense of responsibility. In addition, Cooperative organization can be viewed as member-based-association (Kadarisman Hidayat, Suharyono, Srikandi Kumadji, & Solimun, 2014).Income distribution within producer cooperatives is structured along egalitarian principle. Members receive equal pay for equal works while differences in the number of hours worked are minimized (King, 2017).

In terms of voting weight and unlike a CF (Classical Firm), the principle of one person one-vote applies independent of members percentage share of ownership, most producer cooperatives face the thorny problem of hiring non-member workers. In most cases non-members workers receive bonus payments but since they do not own shares in the firm they are excluded from it participatory process, including distribution of profit shares unless accounted for in the bylaws(King, 2017).

Cooperative societies tend to attract a greater proportion of unskilled blue-collar workers and fewer white-collar and managerial workers than CFS. On a more basic level, the patterns of drawing lower skilled workers may be related to the common practice of distributing residual income (a rough equivalent at profit sharing) to cooperative employees. Once bonus payments are factored in, earnings for blue-collars cooperative worker exceeds that of their classical firm colleagues(King, 2017).

Types of Cooperative: There are various types of cooperative society(Kareem, Arigbadu, Akintaro, & Badmus, 2012) identified eleven important one as; producer's cooperative societies, consumer's cooperative society, marketing cooperative society, credit cooperative societies, farming cooperative societies, housing cooperative societies, insurance cooperative societies, transport cooperative society, storage cooperative societies, labour cooperative societies, miscellaneous societies which processing cooperative societies, forestry cooperative societies and poultry farming etc.

Principle of Cooperative Society: The principles of cooperative society includes: voluntary and open membership, democratic member control, member economic participation autonomy and independence, education, training information, cooperation among cooperatives and concern for community.

2.2 Theoretical Review

Theory of Saving

It should be kept in view that one of the fundamental characteristics of a cooperative society is to make some savings for future use. Therefore saving theory had been found useful to this study. The contributions of Modigliani and Brumberg (1954), and Friedman (1957) are particularly relevant to form the bases for the study.

Life cycle hypothesis (Modigliani and Brumberg 1954): Asserted that individuals spread their lifetime consumption evenly over their lives by accumulating savings during earning years and maintaining consumption level after retirement (Kifle, 2012).

The permanent income hypothesis (Friedman 1957): This theory posited that consumption is proportional to a consumer's estimate of permanent income. However, it should be borne in mind that this theory should be applied with caution because it was originally designed for developed countries. Four of these reasons for such limitation in application are: (1)Households in many developing countries tend to be larger.(2)Income in many developing economies is inherently uncertain and cyclical.(3)Individuals are likely to be credit constrained because the levels of poverty are high in developing nations.(4)The above three point jointly suggest that individuals in developing countries save small amounts at regular intervals to smooth income, rather than save for retirement or investment (Kifle, 2012).

2.3 Empirical Review

(Siyanbola, Egbetokun, Oluseyi, Olamade, Aderemi, & Sanni, 2012)Using indigenous switching regression approach to test the impact of extension access and cooperative membership on technology adoption and household welfare, found a consistently positive and statistically significant effect of cooperative membership on technology adoption.

Ma and Abdulai 2016 found a positive and significant impact of cooperative membership on apple yields in china. In Ethiopia, Abebaw and Halie (2013) reported a strong positive impact of cooperative membership on fertilizer adoption. Gebremicheal (2014) found that cooperative membership improves technology adoption and food security especially for rural women.

Kolade and Harpha (2014) in a study that assessed the role of cooperative membership on farmers' uptake of innovations reported that cooperative membership exerts a direct influence of adoption of innovation.

3.0 METHODOLOGY

Research Area: The study was conducted in the six (6) states (Ogun, Oyo, Osun, Ondo, Lagos and Ekiti) ofSouthwest Nigeria.

Research Design: A survey research design was adopted in the study. The dependent variable was technology adoption and the independent variable was of cooperative society membership.

Population: The population of the study was all members of all agricultural cooperatives society in the study area (Southwest Nigeria).

Sample and Sampling Techniques: Multi-stage sampling technique was adopted to select 540 respondents;3 Local Government Areas were selected randomly in each of the 6 states in Southwest Nigeria representing the study area, while 5 agricultural cooperatives enterprises were subsequently selected in each of these local governments and finally, 6 cooperative members were selected in each of the 90 cooperative societies.

Instrument: The relevant data were collected through questionnaire consisting of two (2) scales tagged technology adoption scale and members predilection scale.

Validity and Reliability of the Instrument: In an attempt to establish the psychometric property of the instrument. The instrument was pretested to members of agriculture cooperatives in Ogun State. Cronbach-alpha analysis was used to measure the internal consistency while component factor analysis was used for the validation. The solution revealed that the instrument has a stable psychometric characteristics (alpha=.71). It was found that the instrument provides an objective

means of assessment, evidenced by the result of the principal component factor KMO=.602; p<.05, total variance explained = 0.68.23; communality table extract value ranging from =0.534-8.43; correlation matrix value (p<.05) indicating a sufficient correlation among the items on the scale.

Method of Data Analysis: The data was analyzed using simple linear regression model with the aid of statistical package for social sciences (SPSS).

Model Specification: The model was denoted as $Y=\beta_{0+}\beta_{1+}x_1$

Where Y= Technology Adoption

X= Member Predilection

B_0= Intercept

B_1 = correlation coefficients of x_1

4.0 RESULT

4.1 Presentation of Results

Regression

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.636[a]	.404	.403	1.73397

a. Predictors: (Constant), MembersPredilection

ANOVA[b]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	1096.602	1	1096.602	364.725	.000[a]
	Residual	1617.581	538	3.007		

	Total	2714.183	539			

a. Predictors: (Constant), MembersPredilection

b. Dependent Variable: TechnologyAdoption

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	11.055	1.278		8.648	.000
	MembersPredilection	.609	.032	.636	19.098	.000

a. Dependent Variable: TechnologyAdoption

Correlations

		TechnologyAdoption	MembersPredilection
Pearson Correlation	TechnologyAdoption	1.000	.636
	MembersPredilection	.636	1.000
Sig. (1-tailed)	TechnologyAdoption	.	.000
	MembersPredilection	.000	.
N	TechnologyAdoption	540	540
	MembersPredilection	540	540

4.2 Interpretation of results

To achieve the objectives of the study the hypothesis "Ho" stated below was tested

Research Hypothesis Ho: Cooperatives society membership does not have significant effect on technology adoption (TA). In the test, members' predilection (MP) was regressed on technology adoption and the result reveals that:

i. There is a significant influence of cooperative society membership on technology adoption. This is evidenced by the correlation coefficient value β=.636, t=19.098, and associated significant probability "000" (p<.05). Therefore, the null hypothesis was rejected (see table 3 above).

ii. Member's predilection accounts for 40.3% variation in technology adoption. This is evidenced by the model summary value in table 1 above R=.636, R^2=.404, AdjR^2=.403.

iii. The ANOVA value f(1/538=364.725) indicates that the model of the test is of good fit. See table (1) above.

iv. A unit change in member predilection will results in 63.6% change in technology adoption. See table (3) above.

v. There exists a strong positive relationship between members' predilection and technology adoption evidenced by the value of the correlation matrix R=**.**636

4.3 Summary of Findings

The test of hypothesis carried out indicated that there is a strong positive association between membership of cooperative society and technology adoption. It was revealed that 40.3% of total variation in technology adoption is accounted for by members' predilection. The results aligned with the assertion of Wossen et al (2017). The result also corroborates the claims of the following studies: Abebaw and Halie (2013); Abdoulaye et al. (2013); and Ma and Abdulai (2016), all found out in their studies that agricultural cooperative play a crucial role for technology adoption in the presence of high transitional cost and low bargaining power. Furthermore, the result agreed with the claim of Kolade and Harpha (2014) that cooperative membership exerts a direct influence of adoption of innovation.

5.0 CONCLUSION

Based on the research finding, the followings recommendations are raised: The government should assist cooperative society to improve their capital base through the annual budget of the country. Co-operative research, symposium and public lectures should be organized to create awareness to individual about the benefit of joining cooperative society and also to enhance the effectiveness of cooperative movements in Nigeria. Cooperative society should be linked with extension programme to facilitate technology adoption.

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