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Adoption of Cassava Processing Innovations among Rural Women in Irepodun Local Government Area, Kwara State, Nigeria

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Abstract

This study analyzed women participation in Cassava processing in Irepodun Local Government Area of Kwara State, Nigeria. It explores the intricacies of innovation adoption in rural based cassava processing enterprises in Irepodun Local Government Area of Kwara State, Nigeria. It is therefore pertinent to undertake this study to investigate how the adoption of cassava processing innovations diffuses to the rural women. Primary data were obtained from 100 rural based cassava processors selected through a multistage sampling. The data were analyzed and presented with the use of descriptive statistical tools. Five null hypotheses were tested using z and proportional tests and correlation coefficient. The results show that 76% of the cassava processors adopted most of the improved cassava processing innovations. Adopters and non-adopters of the cassava processing innovation differ significantly in most of their social, economic and innovation related characteristics. The two exceptions are the estimated value of cassava processing enterprise (Naira) and the average distance regularly travelled (km/week). The adopters perceive the use of the innovation as easy and less complex than existing practice and have been in contact with the innovation for longer than non-adopters. The proportion of those aware of all the processing stages is more than those that are not aware. On the basis of the findings, it is recommended that extension agents must try to transfer simple innovations to rural women farmers rather than complex innovations. Also, agricultural extension must adapt to changes taking place in rural setting and provide answers to the problems facing the rural populace.

Keywords: Cassava, Women, Innovation, Processing, rural, Irepodun LGA, Kwara State

Introduction

In Nigeria, women represent about 49% of the population; with their productive and reproductive functions cutting across such activities as performing household chores, income earning activities, community participation and community management roles (Aina, 2003). Over the years, different international for have long recognized the role of women in agriculture and sustainable rural development such as the findings of a study by the United Nations Development Programme (UNDP). Despite government participation in such fora, the full potentials of women have not been exploited in rural development planning efforts in Nigeria. Women are responsible for half of the world's food production and between 60-80% of the food in most developing countries including Nigeria (Gittinger, J.P., et al. 1990). In most countries however, women contribute much less than men towards the value of recorded production; both

quantitatively in labour force participation and qualitatively in educational achievement and skilled manpower (Lawanson, 2008).

Traditionally, women are regarded as homemakers, who oversee and coordinate the affairs and activities at home. Previously in Africa, women remained at home while their husbands and sons went out to the farm to work. But at home, however, they were not idle; as they engaged in manual processing of food crops and other farm produce in addition to their housekeeping duties. With the advent of western education, industrialization and paid employment, men as well as women are drifted into the modern sectors of the economy.

For a country like Nigeria to grow and develop, the agricultural sector has to experience growth and development (Ajadi, 1990). The Prevailing opinion is that agriculture as an occupation is reserved for the men folk but recently, studies on the role of women in agriculture point to the conclusion that women contributed far more to agricultural production than has been generally recognized (Momsen, 1991; Mehra and Rojas, 2008). It has also been estimated that, they contribute two-third of all hours spent in traditional African agriculture and 3/5 of the time spent in marketing agricultural produce (Uganneya and Umaru, 1998). Women are responsible for hoeing, weeding, harvesting crops, processing, preservation and marketing of crops. They also participate in the care of domestic animals and children at home. Furthermore, women participate in development process and engage in other non-farming activities which are all time and energy consuming. Thus, agricultural innovations and techniques are required to increase productivity, level of income, standard of living, reduce drudgery and time spent on farm activities.

However, cassava is one of the major cash crops grown in most parts of Nigeria. Cassava is an important food crop in the tropics, accounting for 33% of all staple foods produced in sub-Saharan Africa (Stella, 2001). Millions of people depend on the crop as a major source of food (energy) as a result of the economic crises in most countries. Also, cassava processing is one of the off-farm activities carried out by the rural women. It is therefore necessary to devise improved techniques capable of increasing the income generating capability of rural women and enhancing acceptability of cassava products. Moreover, it is necessary to identify the constraints facing women employing newly introduced technologies suggested by Agricultural Development Projects (ADP) (Stella, 2001). It is also necessary to have a basis for formulating policies guiding the use of appropriate technology and to develop programmes that will encourage full utilization of the potentials of Nigeria rural women in food production, processing and marketing. However, cassava will improve the rural economy in the humid tropics by reducing surpluses and wastage, increasing demand, expanding the area cultivated and encouraging large scale use of high-yielding production technologies. The market for cassava products exists nationwide and the demand has increased phenomenally since

the beginning of the twentieth century. Production of cassava products and utilization has also expanded appreciably.

Various agricultural innovations have been generated by the State Agricultural Development Project for adoption by women farmers. These include those innovations based on food production, processing of foods and marketing of food crops through packaging. Several adoption studies have focused on increase in farming practices, removal of drudgery involved in peasant production and processing methods and increase in economic base. However, diffusion of such economic innovations has not really been assessed. It is therefore pertinent to undertake this study to investigate the adoption of cassava processing innovations diffused to rural women in the study area. Hence, the major objective of the study is to investigate the adoption of cassava processing technologies to rural women in Irepodun Local Government Area, Kwara State, Nigeria. The specific objectives are to:

- identify the cassava processing innovations transferred to rural women
- assess the level of awareness of the cassava processing innovations in the study area;
- assess the channel of diffusion and the methods of impacting skills and knowledge employed by the extension agents in the study area and
- investigate the level of satisfaction derived by these women who adopt the recommended cassava processing innovations in the study area.

Hypothesis of the Study

- There is no significant relationship between the farming practices of adopters and level of adoption.
- There is no significant relationship between the proportion of those that are aware of cassava processing innovation and those that are not aware
- There is no significant relationship between the selected personal characteristics of the users of Cassava processing technologies and their use of the improved technologies.
- There is no significant relationship between type of technology (traditional and modern) and the use of improved modern technology.

Research Methodology

Study Area

The study was carried out in Kwara State. The state lies between latitudes 7°45 N and 9°30 N and longitudes 2°30 E and 6°25 E and covers a total land area of about 332,500 square kilometers. The state shares boundary with Ondo, Oyo, Osun, Niger and Kogi States in Nigeria and an international border with the Republic of Benin along its north-western part (Christiou, 2001). Agriculture is the main occupation in the state. More than 90 per cent of the state's rural population, who form the bulk of the state's

total population, are engaged in farming. Within the state's climatic pattern is sizeable expanse of arable and rich fertile soils. The vegetation which is mainly wooded Guinea savannah is well suited for the cultivation of a wide variety of staples like, Cassava, Maize and Cowpea. Irepodun Local Government is situated in a rain forest zone and has about 10 wards. Districts are as follows: Omu-Aran, Arandun, Oro, Esie, Ijan, Ajase, Oko. The population for the study consists mainly of women farmers in Irepodun Local Government Area, Kwara State, Nigeria.

Women-In-Agriculture is a component under Extension Sub-programme in Kwara State Agricultural Development Programme (KWADP). Evidence abounds that women in Kwara State in particular and Nigeria in general, participate actively in farming both food and animal production. However, the degree of participation varies from one locality to the other. It is also in appreciation of this laudable role of the rural women that the WARD (Women-In-Agriculture & Rural Development) component was created in KWADP to complement the Extension component activities.

Sources and Methods of Data Collection

Data were obtained from both primary and secondary sources. Primary data were collected through the use of structured questionnaire designed carefully to capture the objectives of the study from the respondents. Secondary data were obtained from textbooks, journals, research paper, annual report from KWADP and other relevant literature to complement the primary data.

Sampling Procedure, Sample Size and Methods of Data Analysis

Random sampling was used in selecting the respondents in the study area. The respondents were selected based on farmers group in the study area. The population for the study consists mainly of women farmers in Irepodun Local Government Area, Kwara State, Nigeria. Therefore, 10 women respondents from each town were randomly selected giving a total 100 women farmers.

Descriptive statistics, such as frequency table, percentages were used to analyze the data collected and the stated hypotheses were tested using proportional and z tests and correlation.

Results and Discussions

The socio-economic characteristics of the respondents are explained in Table 1. Results from Table 1 shows that 54% of the women farmers fall between the ages of 40-49 years which shows that they are within their productive years to utilize cassava processing innovations transferred to them. Also, 58% are Christians and 88% were married with 56% of the respondents having between 4-6 children, furthermore, 41% of the respondents were not educated having about 82% of the respondents farm size less than 2 hectares.

Table 1: Summary of personal, social and occupational characteristics factors

Determinants (factors)	Factors' levels	Frequency	Percentages
Age(year)	20-29	1	1.0
	30-39	22	22.0
	40-49	54	54.0
	50-59	21	21.0
	60 above	2	2.0
	Total	100	100.0
Religion	Islam	40	40.0
	Christianity	58	58.0
	Traditionalist	2	2.0
	Total	100	100.0
Marital status	Single	2	2.0
	Married	88	88.0
	Divorced	3	3.0
	Widow	5	5.0
	Separated	2	2.0
	Total	100	100.0
Number of children	None	1	1.0
	1-3	21	21.0
	4-6	59	59.0
	7-9	15	15.0
	Above 9	4	4.0
	Total	100	100.0
Years of farming experience	1-10	69	69.0
	11-20	20	20.0
	21-30	6	6.0
	Above 30	5	5.0
	Total	100	100.0
Size of farm (hectare)	1-2	82	82.0
	3-4	15	15.0
	4-5	3	3.0
	Total	100	100.0
Primary occupation	Farming	80	80.0
	Trading	14	14.0
	Weaving	3	3.0
	Tailoring	2	2.0
	Civil service	1	1.0
	Total	100	100.0
Educational Qualification	Not educated	41	41.0
	Adult literacy	11	11.0
	Primary education	29	29.0
	Secondary education	11	11.0
	Higher education	8	8.0
	Total	100	100.0
Annual income (N)	Less than 5000	3	3.0
	5100-10000	7	7.0
	10100-15000	4	4.0
	15100-20000	7	7.0
	Above 20000	79	79.0

Contact with extension agent	Total	100	100.0
	Yes	62	62.0
	No	38	38.0
Social group membership	Total	100	100.0
	Cooperative	58	58.0
	Religious group	27	27.0
	Pear group	6	6.0
	Political group	5	5.0
	Traditional group	4	4.0
Source of information	Total	100	100.0
	Friend and neighbor	48	48.0
	Mass media	9	9.0
	Research institutes	2	2.0
	Extension agents	40	40.0
	Marketers/Maternity	1	1.0
Source of capital	Total	100	100.0
	Personal Savings	64	64.0
	Cooperative	23	23.0
	Relations and friends	9	9.0
	Government	4	4.0
Source of labour	Total	100	100.0
	Hired	51	51.0
	Family	49	49.0
Attitudes towards change	Total	100	100.0
	Favourable	82	82.0
	Unfavourable	18	18.0
	Total	100	100.0

This shows that, the respondents are small scale farmers. All the respondents were aware of extension agents and belong to social organization and this encouraged adoption of innovation by sampled women.

The hypothesis to test whether the proportion of those that are aware of cassava processing innovation are more than those that are not aware is as follows:

Hypothesis

$$H_0: P_1 > P_2 \quad \text{Vs.} \quad H_1: P_1 \leq P_2$$

Where P_1 = percentage of those that are aware and P_2 = proportion those that are not aware.

Test statistic. The test statistic is a z-score (z) defined by the following equation.

$$\hat{p}_1 = 0.78, \hat{p}_2 = 0.22,$$

$$Z = \frac{\hat{p}_1 - \hat{p}_2}{\sqrt{P^*(1-P^*)\left(\frac{1}{n_1} + \frac{1}{n_2}\right)}} \sim N(0,1), \quad P^* = \frac{n_1\hat{p}_1 + n_2\hat{p}_2}{n_1 + n_2}$$

$$Z = 1.05, \text{ with p-value} = [1 - \Phi(\sqrt{z})]$$

$$p\text{-value} = 0.1468$$

Decision rule: reject H_0 if p-value is less than 0.05 otherwise accept.

Decision: since the p-value is not less than 0.05, we do not reject H_0

Conclusion: we therefore conclude that the proportion of those aware of all the processing stages is more than those that are not aware base on the analysis.

Also, the hypothesis to test whether people actually adopt the use of cassava processing innovation and how often are they practicing it in Irepodun Local Government is as follows:

Hypothesis

$$H_0: P_1 < P_2 \quad \text{Vs.} \quad H_1: P_1 \geq P_2$$

Where P_1 = percentage of those that adopted the processing (always used) and P_2 = proportion those that are not always used the method

Test statistic. The test statistic is a z-score (z) defined by the following equation.

$$\hat{p}_1 = 0.72, \hat{p}_2 = 0.28,$$

$$Z = \frac{\hat{p}_1 - \hat{p}_2}{\sqrt{P^*(1-P^*)\left(\frac{1}{n_1} + \frac{1}{n_2}\right)}} \sim N(0,1), \quad P^* = \frac{n_1\hat{p}_1 + n_2\hat{p}_2}{n_1 + n_2}$$

$$Z = 4.0256, \text{ with p-value} = [1 - \Phi(\sqrt{z})]$$

$$p\text{-value} = 0.00003$$

Decision rule: reject H_0 if p-value is less than 0.05 otherwise accept.

Decision: since the p-value is less than 0.05, we reject H_0

Conclusion: we therefore conclude that people actually adopted the processing.

Tables 2 and 3 identify whether age in group determine the level of adoption of cassava processing and awareness based on the information collected from rural women in Irepodun Local Government Area.

Table 2: Identification whether Age Group determines the Level of Adoption of Garri Processing and Awareness

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta	B	Std. Error
1	Dependent Variable: Aware of peeling processing: Mechanical peeler etc.					
	(Constant)	1.061	.132		8.038	.000
	Age of respondent	.016	.043	.038	4.670	.004
2	Dependent Variable: Aware of washing process: Aluminum tank					
	(Constant)	1.346	.205		6.568	.000
	Age of respondent	.011	.066	.017	3.171	.002
3	Dependent Variable: mechanized grater, motorized grater, hammer mill etc.					
	(Constant)	1.361	.191		7.106	.000
	Age of respondent	-.023	.062	-.038	5.716	.003

Hypotheses

If there is a significant linear relationship between the level of awareness and the age of respondent the slope will **not** equal zero.

$H_0: B_i = 0$ (no linear relationship) vs.

$H_1: B_i \neq 0$ (there exist a linear relationship)

Decision rule: reject H_0 if p-value is less than 0.05, otherwise do not reject.

Decision: since the p-values are less than 0.05 we reject H_0 .

Conclusion: we therefore conclude that Age of respondent determines the level of awareness.

Table 3: Identification whether Age Group determines the Level of Adoption of Garri Processing and Awareness

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta	B	Std. Error
1	Dependent Variable: Improved washing bowl cleaning					
	(Constant)	1.412	.200		7.063	.000
	Age of respondent	.079	.064	.123	1.227	.223
2	Dependent Variable: Grater for grating (boiling)					
	(Constant)	1.759	.190		9.281	.000
	Age of respondent	-.013	.061	-.022	-.214	.831
3	Dependent Variable: Presser for sacking (DE husking)					
	(Constant)	1.753	.205		8.533	.000
	Age of respondent	-.047	.066	-.072	-.716	.476

Hypotheses

If there is a significant linear relationship between the level of adoption and the age of respondent the slope will **not** equal zero.

$H_0: B_i = 0$ (no linear relationship) vs.

$H_1: B_i \neq 0$ (there exist a linear relationship)

Decision rule: reject H_0 if p-value is less than 0.05, otherwise do not reject.

Decision: since the p-values are less than 0.05 we reject H_0 .

Conclusion: we therefore conclude that Age of respondent does not determine the level of adoption.

Table 4 shows the test if there exist a relationship between the level of adoption and the level of awareness.

Table 4: Correlation Analysis

Control Variables			Aware of peeling	Aware of Washing	Mechanize system
Improved dryer for frying and drying for improvement of the quality shelf-life of cassava & Packaging/Bagging of cassava & Improved sieve for dewatering(sieving)	Aware of peeling processing	Correlation	1.000	-.035	-.069
		Significance (2-tailed)	.	.731	.501
		Degree of freedom	0	95	95
	Aware of Washing process	Correlation	-.035	1.000	.164
		Significance (2-tailed)	.731	.	.109
		Degree of freedom	95	0	95
	Mechanized system	Correlation	-.069	.164	1.000
		Significance (2-tailed)	.501	.109	.
		Degree of freedom	95	95	0

Hypothesis

$H_0: \rho_{12,34} = 0$ (No linear relationship)

$H_1: \rho_{12,34} \neq 0$ (there is linear relationship)

Decision rule: reject H_0 if p-value is less than 0.05, otherwise do not reject.

Decision: since the p-values are less than 0.05 we reject H_0 .

Conclusion: we conclude that there is a linear relationship between the level of awareness and level of adoption.

Conclusion and Recommendations

From the study, it is established that women in Irepodun Local Government Area are aware of cassava processing innovations and majority of them adopt the innovations. On the basis of the findings, it was concluded that age, farming practices and socio group membership have significant relationship with levels of adoption.

Also, the women farmers are faced with quite a number of problems such as labour shortage, complexity of innovations, time resources, compatibility with past ideas, high cost of processing equipment, transportation difficulty, poor infrastructural

facilities, lack of fund and marketing of products are the major constraints for non adoption.

It is recommended that extension agents must try to transfer simple innovations to rural women farmers rather than complex innovations. Also, innovations introduced to rural women farmer must be compatible with their beliefs and farming practices.

The State Agricultural Development Programme should try to help the rural women farmers in the marketing of their products i.e. (cassava flour) for optimum production. In essence, agricultural extension must adapt to changes taking place in rural setting and provide answers to the problems facing the rural populace rather than simply increasing agricultural production, even though this is equally important. Basic amenities such as constant electricity, accessible roads, water and constant availability petrol should be provided as these will have positive effects on small scale cassava processors.

Any recommendations made by the State Agricultural Development Programme should be supported by credit facilities if the capital is huge. Government should make available labour -saving, simple, improved village technologies that are not crude, inefficient and backbreaking in executing users (women) tasks. This will enhance their income and increase the time available to their family upkeep.

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