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Appropriate Technology for Cassava Processing in Nigeria: User's Point of View

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Appropriate Technology for Cassava Processing in Nigeria: User's Point of View

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Abstract

This study examined appropriate agricultural extension technological needs of users in cassava processing activities in Nigeria. Purposive sampling technique was used in selecting 160 participating and non-participating users making a total of 320 users in Oyo state. Data was collected with Interview Schedule and analysed using chi-square and t-test. (58%) of women (users) use traditional processing equipments in cassava processing. Improved processing technologies used include vibrating sieve, abrasive peeler, motorised grater, drum drier, and screw –jack . Processed cassava products include "gari", "lafun", starch, and "fufu". Significant relationships exist between the use of improved technologies for processing and age (X^2 = 6.15, p= 0.05), educational Status (X^2= 5.80, p= 0.05), religion (X^2= 12.20, p= 0.05) and type of technology utilized. Significant difference exists between mean adoption scores of participating and non-participating users (t= 6.53, p= 0.05) . Problems encountered by the users include high cost of processing equipment, transportation difficulties, poor infrastructural facilities, shortage of labour, poor access to market, lack of fund and poor shortage facilities. Time-saving and simpler prototype processing equipment should be introduced to the users of cassava processing technologies during extension training**.**

Keywords: Food security, Appropriate Technology; Cassava Processors, Nigeria.

Introduction

Technology has made pertinent contributions to national progress and its usefulness has attained universal recognition both at national and international levels. In many developing countries including Nigeria, lack of appropriate technological and scientific knowledge application limits agricultural and economic progress. In order to keep pace with the rapid rate of food demand, that is attendant upon rapid population growth and help to improve the gloomy food situation and its consequences, continuous research in food production and efficient extension services is highly desirable.

In Nigeria, modern agricultural technology has contributed significantly to agricultural development and the gap between developed and developing countries in the area of agricultural production can be attributed largely to differences in the level of technological development, adaptation and transfer process. In developed nations, there is an advanced level of technical know-how and widespread application of technological

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innovations resulting in high productive capability in agriculture as well as in industry. This is not so in Nigeria where these technologies are not often available to farmers. Where they are made available, few farmers, usually excluding the users, which are usually women, have access to them (Adekanye, 1983).

Reasons adduced for this low level of access to and subsequent adoption of technological innovations particularly among users (women) include the lack of access to factors of production- land, labour, capital and limited authority for decision making (Odebode, 1997). Users also find such innovations difficult to maintain even when they are appropriate for local conditions due to lack of maintenance and skill training. Consequently, the levels of agricultural production in most developing countries remain low.

In Nigeria, users constitute more than 60% of the adult population resident in the rural areas of Nigeria (Odebode, 1997). They contribute significantly to nation-building economic growth through their roles in agricultural production, housekeeping and child welfare services. However, their traditional contribution to agricultural production has been rendered inefficient by the crude and inappropriate form of agricultural technologies frequently used (Olawoye, 1988). The result is a relatively low agricultural productivity, which is inversely proportional to the enormous labour intensive input. It is therefore important that the use of appropriate technologies by users [rural women] will improve their contribution to national development and that they will adopt improved technologies if such technologies are suited to their need, appropriate for their peculiarities and culture and available within their means, save time, conserve energy, and are compatible with the local environment of the users. Such technologies must be adaptable to the ecological, climatic and physical conditions in order to be functionally relevant.

In a typical rural family in Nigeria, the user has multiple roles to perform. The time allotted to agricultural pursuit by women users is usually relatively shorter compared to their male counterparts. Hence, time, her income, generating capability and level of education seem to influence appropriateness of the technology under consideration. Other factors such as health especially pregnancies [for women in child bearing age-group], and pre-menstrual tensions exert indirect effects on adoption capability. It is therefore clear that the success of a given innovation requires an analysis of the local situation and the creation of conditions that not only make the change feasible but people concerned to desire the proposed changes and identify them with their own personal and social goals.

Improvement of simpler household user-friendly technological methods that will embrace agricultural productivity and economic growth is therefore necessary. This present study was designed to address the following questions:

- What are the selected personal characteristics of the users of these technologies?
- What are the major agricultural activities of rural women in Oyo State?
- What traditional processing techniques are commonly used in the processing of cassava?
- What improved technologies are available for the processing of cassava?
- What factors affect the use of these technologies?
- What are the major constraints facing the users in the processing of cassava in cassava products?

The main objective of this study is to determine appropriate technologies for processing cassava in Oyo State by women cassava processors.

The specific objectives are to:

- examine if any relationship exists between personal characteristics of the users and their agricultural activities,
- investigate agricultural activities of rural women in Oyo State and their present level of technology utilization,
- assess the achievements of the OYSADEP in transferring improved technology to the users of these technologies,
- determine the existing traditional processing techniques and the improved technologies available to the users in the study area,
- determine the most appropriate technologies for local conditions among the users (rural women) in Oyo State .
- identify the problems encountered by the extension personel in the WIA unit of the Agricultural Development Project in Oyo State.

Methodology

Oyo State was chosen as the area of study because it is one of the major agricultural zones in Nigeria with wide varieties of crops. The choice of Oyo state is further necessitated by the fact that the types of data needed for the study are readily available.

Moreover, several studies have credited the women in the eastern and western zones of Nigeria with wide range of involvement in agricultural activities as well as technology adoption, acquisition and use. This study was carried out within the framework of the Oyo State Agricultural Development Programme (OYSADEP).

All the Local Government Areas in Oyo State fall under the four (4) zones of OYSADEP for administrative purposes. The zones include Ibadan, Oyo, Ogbomoso, and Saki. Ibadan zone falls within the rain-forest region; Oyo and Ogbomoso zones are in the derived Savannah and Saki zone fall within the Savannah region. Cassava is grown and processed in Ibadan and Ogbomoso zones. The population of this study comprises all the users (rural women) resident in Oyo State.

The list of all the communities and villages was obtained from the extension agents during the preliminary survey of the selected ADP Blocks and Zones. It was from this list that the target sample of the rural women who participated in the study was drawn. The sample was stratified by participation and non-non-participation on Women-In-Agriculture Unit of the ADP. Two out of the four ADP zones were purposively selected from the cassava-growing zones based on their cassava-growing activities. In each of the two zones, two blocks were selected through random sampling. 2 cells in each block and four villages per cell were also randomly selected.
A total of 16 villages were included in the study.

Ten rural women that are the users of these technologies were purposively selected in each chosen village. Five of these women were participants in the WIA programme, while five were not.

A total of 80 participating and 80 non-participating women were chosen from each zone, making a total sample of 320 women (users).

Table 1.0: Sampled Number of Rural Women by Zone.

	Participating Women (M)	**Non-participating Women (N)**	**TOTAL**
Zone A-Ogbomoso			
Respondents / Villages	5	5	
4 Villages / Cell	20	20	
2 Cells / Block	40	40	
2 Blocks / Zone	80	80	
Total N / Zone A	**80**	**80**	**160**
Zone B- Ibadan / Ibarapa			
Respondents / Villages	5	5	
4 Villages / Cell	20	20	
2 Cells / Block	40	40	
2 Blocks / Zone	80	80	
Total N / Zone B	**80**	**80**	**160**
Total Sample N	**160**	**160**	**320**

Primary data were obtained using Interview Schedule, while the secondary data were collected from existing literature relevant to the research problem.
Both primary and secondary data were used to collect information needed to satisfy the objectives of this study.

Data were collected and analyzed with the aid of descriptive statistics such as frequency counts and percentages to describe the data and inferential statistics using chi-square, t-test and simple regression analyses.

Measurement of Variables

The dependent variable is the use of appropriate cassava processing technologies by the users. This was measured by

i) Determining women farmers' evaluation of effectiveness of the introduced technologies using the Likert type-rating technique of attitude measurement. A 5- point scale of measurement was used to obtain information on users evaluation of the effectiveness of cassava processing technologies

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The evaluation scores ranged from 10-30 for low or unfavourable evaluation, 36-50 for high or favourable evaluation and 26-35 for neutral evaluation.

ii) Use of Improved Cassava Processing Extension Technological Practices were measured by asking whether the users had used, not used or are still using the technologies introduced.

Never Used = 0, Used before or no longer using = 1
Still using = 2

Eight (8) Improved cassava processing practices were employed with the minimum score for respondents not using any of the eight innovations studied as 0, maximum score for total use was 16.

0 to 8 – low adoption (Use)
9 to 16 – High adoption (Use)

The level of use of appropriate extension technology or adoption score is the dependent variable and the most important criterion for determining the degree of technological practices.

The Eight (8) Improved Cassava Processing practices include:

(i) Improved method of picking of stone for cleaning **ii)** Improved washing bowl for washing **(iii)** Improved Grater / Grinder for grating **(iv)** Improved presser **(v)** Improved fermentator **(vi)** Improved Sieve for sieving **(vii)** Improved dryer / fryer for frying **(viii)** Improved for sieving after frying

Independent Variables measured include selected personal characteristics of the users of the processing technologies of cassava such as Age, Marital Status, Household size, Educational Status, Sex etc.

Hypotheses of the Study

In order to achieve the objectives of this study, the following hypotheses were tested:

i) There is no significant relationship between the selected personal characteristics of the users of cassava processing technologies and their use of the improved technologies.
ii) There is no significant difference between the WIA (Women-In-Agriculture) participants and non-participants in respect of their use of improved technology.
iii) There is no significant relationship between type of technology (traditional and improved) and the use of improved technology.

Results and Discussion

The findings include 160 participating and 160 non-participating cassava processing technology users (rural women) in the WIA programme of the Agricultural Development Project.

Age distribution of respondents

Fig. 1.0 shows the age distribution of all sampled WIA participants and non-participants. It determines the availability of able-bodied people for agricultural production, ease of use of innovations and level of risk aversion, all of which have been

formed to affect the rate of agricultural transformation and capable of taking risks and using innovations. A large proportion of the participating users in the study, fall within the age range of 31 to 50 years.

The age-range can be regarded as the youthful age when farmers can make vital impact in agricultural production and development in general. Only 15 percent of the participating users and non-participating ones are 60 years and above in age.

The mean age for the WIA participants is 37.7 years while that of the non-participants is similar (36.3years).

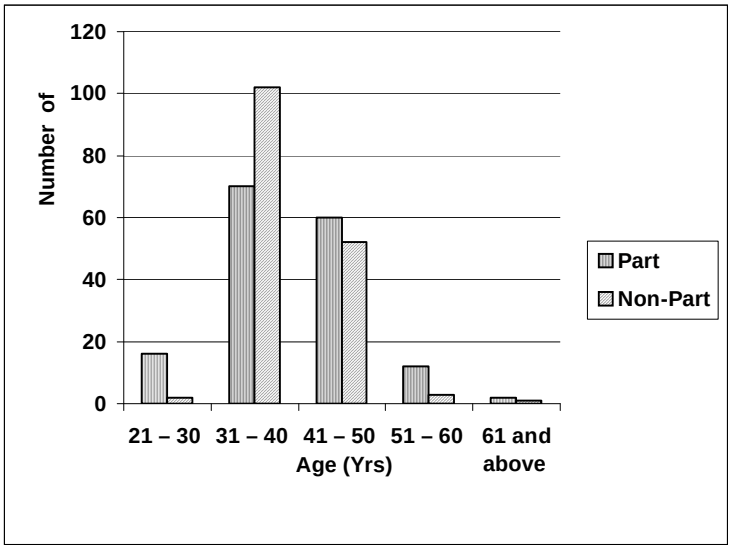

Fig. 1.0: - Distribution of Respondents according to Age

Marital Status of Respondents

Most (80% to 98%) of the participants and non-participants are married. A large proportion of the married participants were monogamous while a greater percentage of the married non-participants were in a polygamous marriage (98%). This implies that WIA users are likely to have greater decision-making power in the household than the he non-participating users where there are other wives.

Educational Qualifications of Respondents

Education is an essential factor for effecting desirable changes in attitudes, skills, and knowledge of individuals. The level of education seemed to be very low in the rural sector of the sampled users (participants) had no formal education. Other users acknowledged having gone to primary school. None of the users in the study area completed secondary education, while 32 percent of them did not complete primary education.

In summary, no non-participant had any formal education. This implies that women participants are relatively more educated than the non-participants. This may be because WIA agents selected more educated women for the groups or because more educated users were more interested in participating.(Please delete Fig 2.)

Religion of Users of Improved Technologies

A large percentage (62% to 78%) of the users, participants and non-participants were Christians, very few (between 30% and 10%) were Muslims, while others (8% and 12%) were traditional worshippers. This implies that both Christians and Muslims have equal opportunity of being trained.(This is not a proportion of muslims in Nigeria.The percentage here is only relevant to the study area specifically)

Occupation of Respondents' Husbands

In many rural areas in Nigeria, both men and women often have more than one source of income. This may be as a result of the opportunities available in the community. Women, users or men may therefore, take farming as their primary occupation or as their secondary occupation(Table 2.0). In some cases, some may not be farmers at all depending on their varied sources of income.

Table 2 Distribution of Respondent According to their Primary and Secondary Occupation

C. Primary /Secondary Occupation	**PARTICIPANTS, n = 160**				**NON-PARTICIPANTS, n = 160**			
	Primary		**Secondary**		**Primary**		**Secondary**	
	Frequency	**Percentage**	**Frequency**	**Percentage**	**Frequency**	**Percentage**	**Frequency**	**Percentage**
Farming	8	5.0	152	95.0	152	95.0	8	5.0
Processing	152	95.0	8	5.0	8	5.0	152	95.0
Total	**160**	**100.0**	**160**	**100.0**	**160**	**100.0**	**160**	**100.0**

Agricultural Activities of Users of Cassava processing technologies

Source of Farmland

Most (66% and 56%) of the users of the improved cassava processing technologies got their farmlands from their husbands (66% and 56%). The second highest source of farmland is the "family land" (Inherited land) i.e. the husbands extended family. This can be explained by the fact that most rural land belong to the kith and kin, with the head of the family being in charge of the allocation of the family land. The land if scattered in different places and it is usually shared among the wives of the head of the family. Other few women use part of their husband's land. There are indications that individual members of cooperative societies freely donate land for group farming. Land is leased out to interested users from family and community land. Availability of land for farming will enhance agricultural transformation and consequently users productivity and welfare.

Farm Size and User's Land

Farm size has direct implication for some policy issues such as farm business, income, profit, and structural organization of the agricultural industries as well as use of innovations. The average sizes of farms operated by WIA participating users are larger (X= 2.85 ha) than the farms of non=participating users (X= 2.31 ha). The average farm size for all respondents is 2.58 ha.

The farm size per participating users is thus consistently higher than for the non-participants. The results show that participating sampled women farmers have greater potential to expand their production capabilities. The smaller farm size for non-participants is likely to be related to the large number of women farmers working on a group farm. It is possible that having bigger farms and who are better off may be more likely to participate in the WIA programme.

Women Labour and Time Input on the farm

The amount of women's labour on the farm was examined during the study. The tasks for which labour is needed include land clearing, weeding, staking, fertilizer application, spraying, harvesting, transportation, processing and marketing. Some of the operations carried out on the farm were mainly done by the women who are the users themselves, while some had to rely either on family members such as husband or the male children, female children and hired labourers. The study showed that husbands, male and female children, hired labour and other relatives were those who mainly rendered help to the women interviewed to fill the labour vacuum in farm operations.

The analysis revealed that a large proportion of the participating farmers spend more time on the farm during the rainy season as would be expected and less time on the farm during the dry season. The mean number of hours spent on the farm is 4.2 hours and 3.7 hours during the rainy and dry season respectively.

This implies that they have more time for other activities such as trading and house upkeep during the dry season. Any arrangement aimed at improving farm efficiency should pay particular attention on how to reduce intensity of labour use for land clearing, weeding, harvesting and processing operations on the farm. These operations can constitute major bottlenecks and strain on farm labour supply.

Source of Labour during Processing

Most of the processing operations were carried out by the users themselves, while others rely on family members such as male or female children, hired labour or personal labour. Most participating users depend on a combination of family, personal and hired labour (59.4%). Some users rely on their own efforts (18.8%). Some on hired labour only (21.8%), while 3% of them depend on family labour alone.

For the non-participants, 60% of them indicated having between 3 and 9 male children while 94.4% have between 3 and 9 female children. Most of the female children are engaged in giving help to their mothers during processing, while their male counterparts are engaged in giving help on the participating user's farm, which shows gender division of labour evidenced by adult.

The traditional and improved cassava processing technologies in the study areas are as stated in table 3.0 below:

Improved cassava processing technologies to which women have been exposed through the activities of change agents include improved peeler, grater, grinder, sieve, hydraulic press, and dryer. The traditional processing cassavainclude the use of traditional peeler, grater, press or screw jack, and local fryer and basket sieve. Participants in the WIA programme enjoy a number of advantages. They have greater knowledge of and easier access to new technologies than their non-participating counterparts. They therefore used most of the improved processing technologies introduced by the WIA extension agents. Widely used improved cassava processing equipment include vibrating sieve, mechanical peeler, motorized grater, motorized drier, screw jack, hydraulic press(Table3.0).and the major reason for using them is for profit maximization. The cassava products include Gari, Lafun(Cassava flour),Cassava Starch, Fufu(Cassava dough).The processing stages are stated in the table below.

Table 3.0- Traditional and Improved Cassava Processing Technologies / Equipment in the Study Area.

Processing Stages	Traditional Technology	Improved Technology
A. GARI **1. Peeling**	Knife made of bamboo, flint or metal	▪ Mechanical peeler ▪ Motorised peeler ▪ Hand peeler, hand rasper
2. Washing	Local Calabash bowl	Aluminium tank
3. Grating	Rough Stone, prickly trunk of palms sheet / tin iron pierced with nail on one side	Mechanized Grater, Motorised grater, Hammer mill, disk grater, hand grater.
4. Fermentation	Heavy stone on heavy weighed cloth or nylon bag	Batch fermentation in aluminium tank, locally made hydraulic or mechanical
5. Dewatering Pressing	Heavy stone on heavy weighed cloth nylon bag (for several days)	Hydraulic jack press, screw press, parallel board press, upgraded trad. Press for few minutes.
6. Sieving	Woven baskets, suspended cloth pieces holding mash	Improved pulverizer e.g. drum sieve, rotating sieve

7. Frying / Revasting	Cast Iron pan over wood fire	Upgraded roaster, solar dryer, kiln type dryer
8. Sifting	Woven basket	Improved pulverizer and sifter
B. LAFUN		
1. Peeling	**Knife made of bamboo, flint or metal**	**Mechanical peeler, motorised peeler, hand rasper**
2. Soaking	**Local Calabash**	**Aluminium tank**
3. Pulverizing	**Woven basket**	**Improved pulverizer**
4. Dewatering	**Heavy stone on heavy weighed cloth or nylon bag**	**Hydraulic press, Mechanical press**
5. Drying	**Cast iron pan over wood fire**	**Drum dryer, solar dryer**
C. STARCH		
1. Peeling	Knife made of bamboo	Mechanical peeler, Cassava filter, Motorised peeler
2. Washing	Calabash bowl	Aluminium tank
3. Grating	Sheet or tin iron pierced with nail on one side	Power grater, motorized grater, Disc grater
4. Dewatering	Heavy stone on heavy weighed cloth or nylon bag	Hydraulic press, screw press
5. Drying	Cast iron pan over wood fire	Engraved fryer, solar dryer
6. Packaging	Local jute bag	Scaled polythene bags

D. FUFU 1. Peeling	Local Knife	Hand peeler – (mechanized)
2. Washing	Local Calabash bowl	Aluminium tank
3. Grating	Rough Stone	Motorized grater, Rotatary grater
4. Dewatering	Heavy Stone on heavy weighed cloth	Mechanized press, Hydraulic press
5. Packaging	Local Jute bag	Hydraulic polythene bag

Test of Hypothesis

Hypothesis 1

There is no significant relationship between the selected personal characteristics and their use of improved cassava processing technologies. Hence, the null hypotheses were rejected and the alternative hypotheses were accepted.

Relationship between Selected Personal Characteristics of Users of Cassava Processing Technologies and their Use of Improved Cassava Processing Technologies

A Chi-square test was used to find out if any relationship exists between Selected Personal Characteristics of Users of Cassava Processing Technologies and their Use of Improved Cassava Processing Technologies, including Age (X^2 = 6.15, p= 0.05), Educational Status (X^2= 5.80, p= 0.05), Religion (X^2= 12.20, p= 0.05). No significant relationship exists between the selected personal characteristics and their use of improved cassava processing technologies. The null hypotheses were rejected and the alternative hypotheses were accepted.

This implies that age, educational status and religion have significant relationships with the use of improved cassava technologies (table 4.0)

Table 4.0: - Chi-square test of relationship between Selected Personal Characteristics of Users of Cassava Processing Technologies and their Use of Improved Cassava Processing Technologies

Variable	**X^2 Tabulated**	**X^2 Calculated**	**df**	**p**	**Remark**
Age	3.84	6.10	1	0.05	Reject Ho Accept Alternative Ho
Educational status	3.84	5.80	1	0.05	Reject Ho
Religion	3.84	12.20	1	0.05	Reject Ho

df – degree of freedom
p – probability = 0.05

Hypothesis 2: There is no significant difference between Means of the Use of improved technologies by WIA participants and non-participants.
The results of the t-test of difference reveals that the t-value calculated are greater than the t-value tabulated. Hence, the null hypothesis is rejected, and the alternative hypothesis accepted i.e. there is therefore a significant difference between Means of the Use of improved technologies by WIA participants and non-participants.

Table 5.0: - *T-test of Difference Between Means of the Use of Improved Technologies by WIA Participants and Non-participants*

Use of Improved Technology	**Means**	**Calculated t-value**	**Tabulated t-value**	**P**	**Remark**
Participants	23.15	6.37	1.65	0.05	Reject Ho
Non-participants	18.15				Accept Alternative Ho

Hypothesis 3: There is no significant difference between the use of improved technologies (type of technology) by the WIA participant and non-participant women farmers.

Table 6.0 reveals that there is a significant difference between the mean adoption scores of WIA participants and non-participants.
The table shows that the calculated t-value (6.37), on table 6.0 there is no 6.53 value is greater than the tabulated t-value (1.65, p= 0.5 this value is not there either). Therefore, the null hypothesis is rejected. That is, there is a significant difference between the use of improved technologies by the participants and the non-participants

In other words, women farmers participating in the WIA programme adopted more cassava/soyabean processing technologies than the non-participants. This can be interpreted to mean the participation in WIA programme beneficially affected the adoption behaviour of the participants and it is directly responsible for higher adoption scores.

Table 6.0: T-test of Difference Between Means of Adoption and the Use of Improved Technology

Adoption of Improved Technology	**Means (X)**	**Calculated t-value**	**Tabulated t-value**	**P**

Participants	23.15			
		6.37	1.65	0.5
Non-Participants	18.15			

Adoption of Recommended Improved technologies on Cassava Processing

Table7.0 shows the sampled users adoption behaviour of recommended cassava processing
Values. It shows that users are mostly using improved technologies such as washing bowl, presser, dryer, and sieve while the use is rather low in respect of grater, improved fermentator and mechanized peeler. Participating users have higher adoption scores than the non-participating users .This is reflected in the number of participants which is comparatively higher than the non-participants on all the innovations disseminated except improved dryer for which the difference is small. Nearly all of them are using them. The use of the innovations is comparatively higher for the non-participants with regards to mechanized peeler and fermentator. This may be due to their participation in WIA activities.

Table 7.0: Distribution of Respondents According to the Adoption of Recommended Improved technologies on Cassava Processing

Recommended Practices of Innovations (Cassava)	**Participants**			**Non-Participants**			**Total**		
	Not Used (0)	**Used (1)**	**Using (2)**	**Not Used (0)**	**Used (1)**	**Using (2)**	**Not Used (0)**	**Used (1)**	**Using (2)**
Peeler for peeling (picking of stone)	27.5	5.5	17.5	87.5	10	12.5	57.5	32.5	10
Improved washing bowl cleaning	-	7.5	92.5	-	20	80	-	13.7	86.2
Grater for grating (Boiling)	2.5	62.5	35.0	40	55	5	21.3	58.7	20.0
Presser for sacking (Dehusking)	2.5	25.0	72.5	40	47.5	12.5	21.2	36.2	2.5
Fermentator for fermentation (Grinding)	70	17.5	12.5	85	12.5	2.5	77.5	15.0	7.5
Improved sieve									

for dewatering (Sieving)	-	10	90	-	15	35	-	12.0	87.5
Improved fryer for frying (Fermentation)	2.5	62.5	35.0	45	42.5	12.5	23.7	32.7	23.7
Improved Dryer for frying and drying	-	5.0	95.0	-	-	100	-	2.5	97.5

Major Problems facing the users of Improved Cassava Processing Technologies

The problem enumerated by the users in order of severity include high cost of equipment, unavailability of sufficient machine, difficulty in operating machine, shortage of labour, transport problems, heavy weight of equipment, lack of essential infrastructural facilities and insufficient extension staff to teach new innovations. .

Is tis part of recommendation or finding?

Conclusions and Recommendations

The major conclusions and recommendations of this study are stated below:

- A large proportion of the users are within their productive years. The predominant age ranged between 31 and 50years while a large proportion of them are married.
- Users of the improved technologies enjoy a number of advantages over the non-participants. They have greater knowledge to and easier access to new extension technologies than their counterparts
- The users were literates and used most of the improved cassava processing technologies. Users were therefore better adopters.
  Widely used improved extension technologies include mechanized peelers, motorized graters and driers, screw jack, hydraulic press.
  Age, Level of education, and Religion are significantly related to the level of use of innovation.
- There is no significant difference between the adoption scores of participants and non-participants with the participants having higher scores.
- A significant difference exists between users and non-users level of participation.
- Major problems encountered by the users in order of severity include shortage of labour, high cost of processing equipment, transportation difficulty, poor infrastructural facilities, and lack of fund.

Recommendations

- Technologies introduced through the extension agents must be relevant to the needs of rural women who are the users and the degree of their sophistication should not be beyond their comprehension
- The government should make the users aware of appropriate technologies that can reduce labour bottlenecks and enhance processing and home activities in the state. Existing technologies must be relevant to the needs of the users.

- Agricultural technologies developers should be mindful of users involvement in agriculture when designing technologies for use in processing. Such gadgets should be easy to use and developers should be able to assess the economic or financial capabilities of the intended users and produce appropriate technologies that are within the adopters.
- Efforts should be made by technology developers in making new processing technologies and devices as close as possible to the existing traditional ones. This will facilitate acceptability.
- 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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