

Table 4: Showing the response to the questions on inter-personal relationship among the two communities that were asked

| S/ N | Questions | Response | Ife % (n = 195) | Modakeke % (n = 195) | Total % (n = 390) |
|---------|--|-----------------|--------------------|-------------------------|----------------------|
| 1 | Do people in this community marry from Ife/Modakeke community? | Yes | 89.2 | 96.4 | 92.8 |
| | | No | 10.8 | 3.1 | 6.4 |
| 2 | How do you see women from Ife/Modakeke that is married to the people of this community? | (1) Kinsmen | 56.4 | 70.3 | 63.3 |
| | | (2) Stranger | 3.1 | 1.0 | 2.1 |
| | | (3) Enemy | 17.4 | 7.7 | 12.6 |
| | | (4) Indifferent | 22.6 | 20.5 | 21.5 |
| 3 | Can you encourage your children to marry from Ife/Modakeke community? | Yes | 53.8 | 73.8 | 63.8 |
| | | No | 46.2 | 26.2 | 36.2 |
| 4 | Can you encourage your relations to marry from Ife/Modakeke community? | Yes | 51.8 | 73.8 | 62.8 |
| | | No | 44.1 | 24.6 | 34.4 |
| 5 | Can you as a person marry Ife/Modakeke person? | Yes | 46.2 | 62.6 | 54.4 |
| | | No | 47.7 | 32.8 | 40.3 |
| 6 | How do you see the children of the women from Ife/Modakeke that are married to the people of this community? | (1) Kinsmen | 55.4 | 64.6 | 60.0 |
| | | (2) Stranger | 4.1 | 2.6 | 3.3 |
| | | (3) Enemy | 16.9 | 10.3 | 13.6 |
| | | (4) Indifferent | 21.5 | 21.0 | 21.3 |

Field survey, 2006

Table 5: How Inter-personal relationship indicators are measured

| Inter-personal relationship indicators | How measured |
|---|--|
| If people in this community marry from Ife/Modakeke community | 1 if yes, 0 otherwise |
| The way women from Ife/Modakeke that are married to the people of this community are seen | 1 if they are seen as kinsmen, 0 otherwise |
| If you encourage your children to marry from Ife/Modakeke community | 1 if yes, 0 otherwise |
| If you encourage your relations to marry from Ife/Modakeke community | 1 if yes, 0 otherwise |
| If you as a person marry Ife/Modakeke person | 1 if yes, 0 otherwise |
| The way children of the women from Ife/Modakeke that are married to the people of this community are seen | 1 if they are seen as kinsmen, 0 otherwise |

Table 6: How Socio-economic characteristics variables are measured

| Socio-economic characteristics variables | How measured |
|--|---|
| Age | Total number in years |
| Marital status | 1 if married, 0 otherwise |
| Educational level | 1 if post secondary education, 0 otherwise |
| Employment status | 1 if employed or self employed , 0 otherwise |
| Location of place of work | 1 if within the community of residence, 0 otherwise |
| Income | Total in Naira |
| Household size | Total in numbers |
| Number of children in the household | Total in numbers |
| Age of the youngest child | Total in years |
| Land ownership | 1 if having plot(s) of land, 0 otherwise |
| Most important organization belonged to | 1 if most important organization belonged to is ethnic organization |
| Length of stay in the community | Total in years |
| Having relative in the other community (Ife or Modakeke) | 1 if having relative in the other community, 0 otherwise |

Table 7: Measure of ethnic attachment as reflected from peoples' attitude towards violence/conflict/use of weapons

| S/N | Attitude towards violence/conflict/use of weapons | How measured |
|-----|---|-----------------------|
| 1 | If opposed to the idea of people carrying weapons | 1 if No, 0 otherwise |
| 2 | If would encourage others to carry weapons and fight | 1 if yes, 0 otherwise |
| 3 | If think that violence is the best way of expressing dissatisfaction | 1 if yes, 0 otherwise |
| 4 | If think that violent fighting between the two community is necessary | 1 if yes, 0 otherwise |
| 5 | If making financial contribution to the community | 1 if yes, 0 otherwise |
| 6 | If the respondent encouraged their children to make financial contribution to the community | 1 if yes, 0 otherwise |
| 7 | If the respondent encouraged their spouse to make financial contribution to the community | 1 if yes, 0 otherwise |
| 8 | If the respondent encouraged their relative to make financial contribution to the community | 1 if yes, 0 otherwise |
| 9 | If the respondent encouraged women to make financial contribution to the community | 1 if yes, 0 otherwise |
| 10 | If attend community meetings | 1 if yes, 0 otherwise |
| 11 | If respondent encouraged their spouse to attend community meetings | 1 if yes, 0 otherwise |
| 12 | If respondent encouraged their children to attend community meetings | 1 if yes, 0 otherwise |
| 13 | If respondent encouraged their female children to attend community meetings | 1 if yes, 0 otherwise |
| 14 | If respondent encouraged other women to attend community meetings | 1 if yes, 0 otherwise |

The result of the correlation analysis between the inter-personal relationships among the people of the two communities and their socio-economic characteristics is shown in Table 8. The Table shows that there is significant relationship between inter-personal relationship among Ife and Modakeke people and age, age of the youngest child, land ownership, if most important organization belonged to is ethnic organization, and having relative in the other community (Ife or Modakeke). Also, the result shows a negative relationship between interpersonal relationships among Ife and Modakeke people and age, educational level, employment status, location of the place of work, income, age of the youngest child, most important organization belonged to and length of stay in the community. This result implies that inter-personal relationship decreases with increasing age, educational level, employment status, income, age of the youngest child and length of stay in the community. Also, the result implies that inter-personal relationship decreases with increasing location of the place of work within the community of residence and increasing belonging to ethnic organization.

The result of the correlation analysis between inter-personal relationship and age which shows negative relationship implies that there is less inter-personal relationship among the people of the two communities as people grow older. This result underscored the importance of the role of the elderly and the leaders of the two communities who of course are elderly people in the construction of different ethnic identities. This is in line with the observation in the literature that ethnic leaders help in the creation of ethnic identities (Short, 1996).

The result of the correlation analysis between inter-personal relationship and location of the place of work and length of stay in the community which shows negative relationship implies that the more people stay in their community of residence, the less is their involvement in inter-personal relationship with the people of the other community. This result suggests that segregated residence of Ife and Modakeke communities facilitates the construction of different identity. Observation from the literature shows that segregation hardly solves the problem of a plural society; it rather compounds it (Albert, 1999). According to Albert (1999), had the Modakekes been allowed to integrate into the Ife society rather than be segregated in a particular settlement, they would have by now mixed so much with the Ife population that it would be difficult for them to lay claims to any separatist identity. The ownership of buildings in the city would have been mixed in the area that now constitutes "Ife" or "Modakeke"; and more Ifes and Modakekes would have inter-married. Albert cited the example of Ibadan as a typical example of a Yoruba city in which all migrant groups, including those from Ife and Oyo, have now integrated. The physical development of the city, as well as, its traditional political system left no room for any group to allege discrimination against it.

The result further shows a positive relationship between interpersonal relationships among Ife and Modakeke people and marital status, household size, number of children in the household, land ownership and having relative in the other community (Ife or Modakeke). This result implies that inter-personal relationship among Ife and Modakeke people increases with increasing number of married people, household size, number of children in the household, land

ownership, and having relative in the other community (Ife or Modakeke). shows a negative relationship between ethnic attachment and inter-personal relationships among the people of the two communities. The result of the correlation analysis between ethnic attachment and inter-personal relationships among the people of the two communities is shown in Table 9. From the Table the result of the correlation analysis This result implies that the more there is ethnic attachment, the less is interpersonal relationship among the people of the two communities.

Table 8: Result of the correlation analysis between socio-economic characteristics and inter-personal relationship among Ife-Modakeke people

| Socio-economic characteristics | Inter-personal relationship among Ife-Modakeke people (Spearman Correlation) 'r' |
|--|--|
| Age | -.122* |
| Marital status | .004 |
| Educational level | -.041 |
| Employment status | -.050 |
| Location of place of work | -.019 |
| Income | -.077 |
| Household size | .011 |
| Number of children in the household | .014 |
| Age of the youngest child | |
| Age of the youngest child | -.123* |
| Land ownership | .229* |
| Most important organization belonged to | -.157** |
| Length of stay in the community | -.049 |
| Having relative in the other community (Ife or Modakeke) | .118* |

*Significant at $p < .05$
Field survey, 2006

**Significant at $p < .01$

Table 9: Result of the correlation analysis between ethnic attachment and inter-personal relationships among the people of the two communities

| | Ethnic attachment |
|-----------------------------|---|
| | Ife-Modakeke (Spearman correlation) 'r' |
| Inter-personal relationship | |
| | -.091 |

*Significant at $p < .05$
Field survey, 2006

**Significant at $p < .01$

SUMMARY, POLICY IMPLICATIONS AND CONCLUSION

The paper presents a preliminary report on ethnicity and urban landlords/tenants relationship and conflicts in Nigeria: the case of Ife-Modakeke. Historical accounts have it that Ifes and Modakekes are sons and daughters of the same parents. As Yorubas, their ancestry is traced to Oduduwa the progenitor of Yoruba race nevertheless, Ife and Modakeke people sees themselves as a different social group. The major factors that have helped in the construction of different social identity are their historical background and Yoruba language pronunciation. Observation from the literature shows that given the circumstance that led to the birth of Modakeke, and despite the fact that Ile-Ife city has the historic image as the aboriginal home of the Yoruba people, the status of Modakeke and that of its people has always been a source of dispute and conflict due to issues relating to landlord/tenant relationship or indigene/non-indigene and by extension the problem of citizenship issue. The study reveals that ethnic attachment is high and inter-personal relationship among the people in the two communities is not that very cordial. The result reveal that women that are married to the other community and particularly their children have identity crisis in the sense that some sees them as strangers and enemy, although quiet a percentage of the respondents sees them as kinsmen.

The result of the correlation analysis shows that there is significant relationship between inter-personal relationship among Ife and Modakeke people and age, age of the youngest child, land ownership, if most important organization belonged to is ethnic organisation, and having relative in the

other community (Ife or Modakeke). The result also shows a negative relationship between interpersonal relationships among Ife and Modakeke people and age, educational level, employment status, location of the place of work, income, age of the youngest child, most important organization belonged to and length of stay in the community. This implies that inter-personal relationship decreases with increasing age, educational level, employment status, income, age of the youngest child and length of stay in the community. Also, the result implies that inter-personal relationship decreases with increasing location of the place of work within the community of residence and increasing belonging to ethnic organization. The result further shows a positive relationship between interpersonal relationships among Ife and Modakeke people and marital status, household size, number of children in the household, land ownership and having relative in the other community (Ife or Modakeke). This implies that inter-personal relationship among Ife and Modakeke people increases with increasing number of married people, household size, number of children in the household, land ownership, and having relative in the other community (Ife or Modakeke). The result of the correlation analysis between inter-personal relationship and age which shows negative relationship implies that there is less inter-personal relationship among the people of the two communities as people grow older. This result underscored the importance of the elderly in the construction of different identities. The result of the correlation analysis between inter-personal relationship and location of the place of work and length of stay in the community which shows negative relationship implies that the more people stay in their community of residence, the less is their involvement in inter-personal relationship with

the people of the other community. The result of the correlation analysis between ethnic attachment and inter-personal relationships among the people of the two communities though found not to be significant shows a negative relationship between ethnic attachment and inter-personal relationships among the people of the two communities. This result implies that the more there is ethnic attachment, the less is interpersonal relationship among the people of the two communities.

This result suggest that for sustainable peace to be attained there is the need to pursue policies that encourages social integration, as well as policies that discourages strong ethnic attachment and the spread of ethnically related organizations in the two communities. As observed in the literature and as suggested by P. van den Berghe (1987) that the government is best which pays least attention to ethnicity. Also Oladoyin (2001) notes that nationalism will crumble if ethnicity is promoted as a virtue, over the national interest. However, in order to discourage strong ethnic attachment, much work has to be done in area of psycho-social work which aims at both psycho-social healing and psychological transformation.

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ANALYSIS OF RESOURCE-USE EFFICIENCY IN BENISEED PRODUCTION IN OBI AND DOMA LOCAL GOVERNMENT AREAS OF NASSARAWA STATE, NIGERIA

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ABSTRACT

Beniseed has been recognized as a crop with high economic potential in Nigeria, both as source of raw materials for industries and reliable foreign exchange earner. The study assessed resource-use efficiency in beniseed production in Obi and Doma Local Government Areas of Nassarawa state during 2004/2005 farming season. Data were collected through multi-stage sampling procedure from 200 respondents. Data were analyzed using descriptive statistics and stochastic production frontier analysis. The technical efficiency index estimated for beniseed farmers was 0.59 which indicated inefficiency in current production practices. The efficiency indices for allocative and overall economic efficiencies were estimated to be 0.41 and 0.24 respectively. The findings showed that farm size, tractor service and hired labour significantly influenced technical efficiency ($p < 0.01$). The socio-economic factors associated with higher technical efficiency of the farmers included age, access to credit and fertilizer use ($p < 0.10$); frequency of extension visit ($p < 0.10$) significantly influenced allocative efficiency while overall economic efficiency was significantly ($p < 0.01$) influenced by use of fertilizer, selling price and access to credit ($p < 0.10$). The study concluded that high level of inefficiency exists under the present production practices and therefore recommends that resources such as fertilizer, tractor services and that credit should be made available to farmers for improved beniseed production.

Keywords: Resource-use, efficiency, beniseed, Nassarawa state.

INTRODUCTION

In recent times the major concern of the Federal Government of Nigeria is to be self-sufficient in food production, diversify its economic resources as well as achieve a sustainable economic development. To this effect, efforts are being made to revitalize the agricultural sector. In 2002, a stakeholder's summit aimed at evaluating the agricultural sector was held, at the end of which emphasis was placed on production

of beniseed among other crops with high export value.

Beniseed (*Sesamum indicum*) belongs to the division spermatophyte and family *Pedaliaceae*. It is a crop of great antiquity and probably one of the most ancient oilseed crops under cultivation (Weiss, 1983). It is believed to have originated in Africa and is well established in the Savanna regions of the continent. It is essentially a tropical and

sub-tropical plant. There are about 19 species of beniseed indigenous to Africa (Uzo, 1998). Beniseed is a rich source of oil (44%) and protein (19-25%). The oil is used for cooking and as raw material for the production of some industrial materials including paints, margarine and varnishes. Its protein content has a high desirable amino-acid profile and is nutritionally as good as soy bean protein (Akintunde and Tunde-Akintunde, 2004). The oil is a rich source of lecithin and essential fatty acid.

Nigeria has a great potential for production of beniseed for both domestic and export markets. An estimated 3.5million hectares of the country's agricultural land is suitable for its production even under low input systems.(Alegbejo *et al.*, 2003) Out of this about 334,685 ha has so far being cultivated (RMRDC, 2004).

Beniseed has over 15% margin in terms of value added compared to other cash crops such as sheanuts and palm-kernels. For instance in the year 2000, a tone of beniseed (raw seed) sold for N72000 while processed oil of the same quantity sold for N350,000.00. Because of its economic importance and various uses, research work on beniseed has come out with varieties which are high yielding. However, yields on farmers' fields in Nigeria are between 500kg -750kg per ha (RMRDC, 2004) which is low compared with yields of 1000kg and above recorded in the United State of America (USA) and other countries.

For sustainable food security, strategies have to be developed to increase food production. One of the ways to achieve this is through efficient use of resources which is defined as the ability to derive maximum output per unit of resources. Farrel (1957)

distinguishes between three types of efficiency viz: technical efficiency (TE) allocative or price efficiency (AE) and economic efficiency (EE). Technical efficiency refers to the achievement of the maximum potential output from a given quantity of input, taking into account physical production relationship. Allocative efficiency refers to the allocation of resources taking into account the prices of factors which implies that the marginal product of each input must be equal to its price while economic efficiency is a term applied to the concept of overall efficiency, which includes allocative and technical efficiencies.

Various methods have been used to measure efficiency but the stochastic approach is preferred because it deals with the stochastic noise and degree of inefficiency (Sharma *et al.*, 1999). The measurement of efficiency (technical, allocative and economic) has remained an area of important research in developing countries where resources are meager and the opportunities for developing and adopting new technologies are dwindling (Ali and Chaudhry, 1990). A measure of efficiency which is a factor of productivity also help developing countries determine to what extent it is possible to raise productivity by improving efficiency with existing resources and the available technology. This could help them decide on how to develop a new technology in the short run (Tadesse and Krishnamoorthy, 1997). Therefore, there is need for a study of this nature which will bring about the evolution/development of appropriate strategies towards improving the production system.

The objective of this study therefore is to examine the efficiency (technical, allocative and economic) of utilization of resources in beniseed production and identify socio-

economic factors associated with efficiency.

MATERIALS AND METHODS

The study was conducted in Obi and Doma Local Government Areas (LGAs) of Nassarawa state Nigeria, because of their reputation for beniseed production. Nassarawa state has a population of 1,863,275 (2006 census) with estimated farm families of 174,008. (Shaib *et al.*, 1997). The State is divided into thirteen Local government area councils that are grouped into southern and western zones (NCRI, 2001). The southern zone, reputed for beniseed production is made of Awe, Doma, Keana, Lafia, Nassarawa – Eggon and Obi LGAs. This study was based on primary data obtained in a cross section survey of 200 farmers involved in beniseed production in Obi and Doma LGAs of Nassarawa State.

The sampled farmers were drawn in a multi-stage random sampling procedure. In the first stage, two LGAs were randomly selected from the six LGAs in the study area. At the second stage, ten farming communities (villages) noted for beniseed production were purposively chosen from the list of beniseed growing communities in each LGA.

The final stage of the sampling process involved purposive selection of 10 farmers that were involved in beniseed production during 2004/2005 cropping season; from each of the twenty villages. The purposive selection of identified beniseed growing communities and farmers became necessary because not all communities or farmers in the selected study area cultivated beniseed. However, a total of one hundred and ninety five (195) questionnaire administered were found to be adequate for our analysis.

Analysis of data

Efficiency and its determinants were estimated using the Stochastic Production Frontier (SPF) following Battese and Coelli (1992) and Chavas and Roln (2005) in a two stage estimation approach. This method involves the specification of the following SPF;

$$\ln Y_i = \beta_0 + \beta_1 \ln X_1 + \beta_2 \ln X_2 + \beta_3 \ln X_3 + \beta_4 \ln X_4 + \beta_5 \ln X_5 + \beta_6 \ln X_6 + U_i - V_i \quad (1)$$

where:

Y_i = beniseed output of the i th farmer in kg

X_1 = farm size in ha

X_2 = household labour in mandays.

X_3 = hired labour in mandays.

X_4 = quantity of seed planted in kg

X_5 = quantity of fertilizer used in kg

X_6 = cost of other intermediate materials including herbicides, insecticides, etc., in Naira.

β = vector of production function parameters to be estimated.

V_i = random variable which is assumed to be independently and identically

distributed (*iid*) $N(0, \sigma_v^2)$ and independent of U_i

U_i = non-negative random variable associated with technical inefficiency in production, and is assumed to be identically and independently

distributed half normal (*iid*) $N(\mu, \sigma_u^2)$.

The SPF specified in equation 1 was first estimated using the limdep econometric software, as a first stage problem. The process generated the values of inefficiency term U_i , in addition to the parameters of the SPF. The inefficiency term was then used to estimate the technical efficiency index, which also formed the basis for computing the allo-

cative as well as the overall economic efficiency indices.

Computation of production efficiency indices

Having estimated the *SPF* (1) and the one sided error terms (*ui*) in stage 1, the index of technical, allocative and overall economic efficiency for each farmer were estimated, following Jondrow *et al.* (1982), Battese and Coelli (1992) and Chavas and Roln (2005) as follows:

$$TE_i = \exp(-u_i) \dots\dots\dots(2)$$

$$AE_i = \frac{P_i \times y_i}{TE_i \times R^*} \dots\dots\dots(3)$$

$$EE_i = TE_i \times AE_i \dots\dots\dots(4)$$

where:

- TE_i = index of technical efficiency of the *i*th farm.
- AE_i = index of allocative efficiency of the *i*th farm.
- EE_i = index of overall economic efficiency of the *i*th farm.
- P_i = average price of beniseed (N/Kg) produced on the *i*th farm.
- y_i = yield of beniseed of the *i*th farm kg/ha
- R^* = highest revenue recorded per hectare on the farms in the sample.

Second stage-production efficiency model

Having estimated the various indices of technical, allocative and overall economic efficiency for each farm, the influence of various socio-economic factors on each of these indicators of production efficiency were examined by specifying and estimating the following second-stage production efficiency equations:

$$EFF_j = \delta_{oj} + \sum_{k=1}^{12} \delta_{kj} Z_{kj} + e_j \dots\dots\dots(5)$$

where:

- EFF_j is the vector of the *j*th efficiency index (*j*=1 for *TE*, 2 for *AE* and 3 for *EE*)
- Z_k (*k*=1, 2,.....,12) is the vector of the efficiency changing variables

where

- Z_1 = Age (years)
- Z_2 = Gender (male =0, female 1)
- Z_3 = Educational background (years of formal education)
- Z_4 = Farm size in hectare
- Z_5 = Dummy variable for source of land, 1 if leased and 0 if otherwise
- Z_6 = Dummy variable for cropping pattern; 0 if sole, 1 if mixed
- Z_7 = Dummy variable for type of seed planted; 0 if local variety and 1 if improved variety
- Z_8 = Dummy variable for mode of land preparation; 1 if tractor was used and 0 if otherwise
- Z_9 = Dummy variable on use of fertilizer; 1 if used and 0 if otherwise
- Z_{10} = Dummy variable on use of herbicide; 1 if used and 0 if otherwise
- Z_{11} = Amount of credits accessed in N
- Z_{12} = Frequency of extension visits (No of times during production period).

Equation 5 was estimated by the Tobit regression procedure with the predicted production efficiency indices restricted to lie between 0 and 1. The need for this form of censored regression arises because efficiency estimates can only take on values between zero and one.

RESULTS AND DISCUSSION

General characteristics of farmers

Most of the farmers in the study area (89.2%) are males with average age of 45 years (Table 1). As expected with most economic activities, majority (90.8%) of the farmers were between less than or equal to 60 years with a modal age group of 41–50 years, to which about one-third (30.3%) of the sampled farmers belong. This implies that most of the farmers fall within the active farming age bracket. Majority (74.9%) of the beniseed farmers have farming as their primary occupation, while the remaining 25.1% of the farmers were involved in beniseed production as secondary occupation. Given that most of the beniseed farmers are expectedly involved in its production on full time basis, they are expected to have enough time for tending their crops which will likely enhance their efficiency.

Education plays a significant role in skill acquisition and knowledge transfer (Ogundele, 2003), and can influence output and production efficiency. The results show that majority (69.8%) of the farm operators had no more than primary school education, with as much as 43.1 per cent of the respondents having had no formal education. This high presence of uneducated farmers in the sample may have implication on the farmers' ability to benefit maximally from extension information due perhaps to their inability to read and interpret or record vital information appropriate for improving farming activities.

The average year of experience in beniseed production was 20½. This suggests that an average farmer involved in beniseed production in the study area has been growing beniseed for over 20 years thus is sufficiently experienced in beniseed farming.

During the 2005/2006 production period, majority (65.1%) of the farmers had no more than two contacts with extension agent while 36.4 per cent had no single contact with extension agents during the production season. Against the background of a relatively low level of formal education among beniseed farmers in the study area, this might have some negative implications on the adoption, management and utilization of improved technology.

Farm size is a parameter which has revealed significant influence on efficiency (Johansson, 2005). Theoretically, where economy of size exists in a production process, cultivation of larger farm size may enable farmers to produce more output at lower average costs, thus enhancing production efficiency. The average farm size was 2.5 hectares; this implies that beniseed cultivation in the study area is predominantly operated as small holding farms.

One major determinant of yield, and thus productivity, in agriculture is the variety of seed planted. While local varieties may be more adapted to a local condition, improved (hybrid) varieties tend to be associated with greater yield and other desirable characteristics like resistance to diseases, none shattering, high oil and protein composition.

Estimates of the stochastic production frontier and the associated technical efficiency indices

Table 2 presents results of estimation of the Stochastic Production Frontier in beniseed production and the associated technical efficiency indices. The MLE estimate of the Stochastic Production Frontier revealed that output is significantly influenced by farm size, seed and hired labour, with one percent increase in land, hired labour and seed result-

Table 1: Distribution of Respondents by their General Characteristics

| General characteristics | Frequency | Percentage | Mode/Mean |
|-----------------------------------|-----------|------------|---------------------|
| Age (years) | | | |
| Below 31 | 26 | 13.3 | 45 |
| 31-40 | 53 | 27.2 | |
| 41-50 | 59 | 30.3 | |
| 51-60 | 39 | 20.6 | |
| 61 and above | 18 | 9.2 | |
| Sex | | | |
| Male | 174 | 89.2 | Male |
| Female | 21 | 10.8 | |
| Main occupation | | | |
| Farming | 146 | 74.9 | Farming |
| Trading | 8 | 4.1 | |
| Artisans | 2 | 1.0 | |
| Business men | 2 | 1.0 | |
| Civil servants | 24 | 12.3 | |
| Others | 13 | 6.7 | |
| Educational status | | | |
| No formal education | 84 | 43.1 | No formal education |
| Primary education | 52 | 26.7 | |
| Secondary education | 40 | 20.7 | |
| Tertiary education | 19 | 9.5 | |
| Farming experience (years) | | | |
| Below 10 | 28 | 14.4 | 20.5 |
| 11-20 | 45 | 23.1 | |
| 21-30 | 63 | 32.3 | |
| 31-40 | 41 | 21.0 | |
| Above 40 | 18 | 9.2 | |
| Extension contacts (times) | | | |
| None | 71 | 36.4 | No access |
| 1-2 | 56 | 28.7 | |
| 3-4 | 33 | 16.9 | |
| 5-6 | 25 | 12.8 | |
| 7 or more times | 10 | 5.1 | |
| Farm size (Ha) | | | |
| Below 2 ha | 62 | 31.8 | 2.5 |
| 2-4 ha | 98 | 50.3 | |
| 4-6 ha | 27 | 13.8 | |
| 6 ha and above | 8 | 4.1 | |

Source: Field Survey, 2006

Table 2: Estimates of Stochastic Production Frontier and Technical Efficiency

| Variables | OLS estimates | | MLE estimates | |
|--------------------------------|---------------|---------|---------------|---------|
| | Parameter | t-value | Parameter | t-value |
| Stochastic Production Frontier | | | | |
| Constraint | 5.1163 | 5.65 | 5.0723 | 7.18 |
| Farm size | 0.5781 *** | 6.35 | 0.5133*** | 8.29 |
| Hired labour | 0.0248 | 1.27 | 0.0182** | 2.22 |
| Household labour | 0.1235 *** | 2.79 | 0.0786 | 0.92 |
| Fertilizer | 0.0194 | 1.26 | 0.0168 | 1.12 |
| Intermediate Material Cost | -0.0359 | -0.37 | 0.0519 | 0.67 |
| Seed | 0.2626** | 2.29 | 0.2703*** | 3.84 |
| Technical Efficiency Estimates | | | | |
| Constant | | | 0.6381 | 9.13 |
| Age | | | 0.0019* | 1.88 |
| Gender | | | -0.0531 | -1.29 |
| Education | | | -0.004 | 0.17 |
| Farm size | | | -0.0162*** | -2.79 |
| Lease of land (dummy) | | | -0.0684** | -2.23 |
| Mixed Cropping (dummy) | | | 0.0115 | 0.29 |
| Improved seed (dummy) | | | 0.0788** | 2.22 |
| Tractor use (dummy) | | | -0.0159 | -0.56 |
| Use of fertilizer (dummy) | | | 0.0585** | 1.97 |
| Use of herbicide (dummy) | | | -0.0682* | -1.91 |
| Amount of credits accessed | | | 0.0602** | 2.12 |
| Frequency of extension visit | | | -0.0116 | -1.57 |
| Diagnostic statistics | | | | |
| Lambda | | | 2.4390 | 5.11 |
| Sigma square | | | 0.8135 | 16.12 |
| Log likelihood function | | | -153.85 | |
| Sigma squared (v) | | | 0.09522 | |
| Sigma squared (u) | | | 0.56650 | |

Note: * = Significant at 10%, ** = Significant at 5%, *** = Significant at 1%

Source: Computed from survey data (2006)

ing in 0.51, 0.02 and 0.27% increase in output respectively. Index of technical efficiency of the sampled beniseed farmers ranged from 0.07 to 0.92 with the mean technical efficiency index being 0.59.

Evidence from the technical efficiency estimates shows that increase in age (and therefore, experience) significantly enhances technical efficiency, while increase in farm size as well as use of herbicides significantly lowers technical efficiency. The decline in technical efficiency with respect to herbicides can be attributed to the fact that herbicides naturally affect crops because of its toxic content (phyto-toxicity). This demands that herbicide be used in the right quantity otherwise this can affect the crop stand per hectare resulting to low output while that of farm size could be attributed to diminishing returns to size. Increased access to credits, fertilizer use and planting improved variety of beniseed were revealed to be significantly associated with higher technical efficiency, while farmers that cultivated leased land were found to be significantly less efficient, technically.

Technical efficiency (TE) indices of the

sampled farmers varied from 0.10 to 0.94 with mean TE index been 0.65. This implies that beniseed output by an average farmer in the sample can be increased as much as 35% by improving the technical efficiency in resource use by the farmers with no additional cost.

As shown on Table 3, substantial allocative and overall economic inefficiencies exist in the operations of beniseed farmers in the study area. Majority of the farmers had allocative efficiency (53.9 per cent) and overall economic efficiency (90.3%) indices that were less than 0.4. The mean AE was 0.41 while the mean EE was barely 0.24. This suggests that beniseed farmers in the study area have only been realising about one-quarter of the potential profit realisable from beniseed production in the study area. This finding is consistent with evidence in most sub-Saharan African agriculture. Gutierrez (2003), for instance, observed that between 1994 and 1996 farm income realised in one year by an average farmer in low income country (including Nigeria) is barely what their peers in the Netherlands realised in three days between 1994 and 1996.

Table 3: Efficiency (Frequency) Distribution Estimate for Sampled Beniseed Farmers

| Level of efficiency | Technical efficiency | | Allocative efficiency | | Economic efficiency | |
|---------------------|----------------------|------------|-----------------------|------------|---------------------|------------|
| | Frequency | Percentage | Frequency | Percentage | Frequency | Percentage |
| ≤ 0.20 | 6 | 3.1 | 2 | 1.0 | 80 | 41.0 |
| 0.21 – 0.40 | 22 | 11.3 | 103 | 52.9 | 96 | 49.3 |
| 0.41 – 0.60 | 40 | 20.5 | 72 | 36.9 | 17 | 8.7 |
| > 0.60 | 127 | 65.1 | 18 | 9.2 | 2 | 1.0 |
| Total | 195 | 100 | 195 | 100 | 195 | 100 |

Source: Derived from Analysis of Survey Data, 2006

Determinants of technical in-efficiency in beniseed production

Evidence from the technical inefficiency equation earlier presented on Table 2 shows that while increase in farm size, use of herbicides as well as tractor services are significantly and positively associated with increase in technical inefficiency, increase in age (and therefore, farming experience) significantly increase technical efficiency. This has to do with experience that the older the farmer the more experienced they become which increase efficiency. The decline in technical efficiency with reference to tractor use however, contradicts a-priori expectation. Meanwhile personal communication with some extension agents in the study area and information obtained from the farmers, suggests that this inefficiency may not be unconnected with delay sometimes experienced while trying to use tractor services of Agro-service centres available in the study area.

Determinants of allocative and economic efficiency in beniseed production

Table 4 presents results of Tobit regression model of the determinants of AE and EE. The use of Tobit procedure was necessitated by the need to restrict efficiency estimates within the range of 0 and 1. Evidence from the Tobit models shows that the influence of use of fertilizer, frequency of extension visit and price at which the farmers were able to sell their beniseed are the variables that positively and significantly enhance allocative efficiency of the beniseed farmers. Female farmers were not allocatively efficient as their male counterpart. Use of fertilizer and price at which farmers sold their produce were significant at 1% while gender of farmer and frequency of extension visit were significant 5%.

Furthermore, from Table 4, use of fertilizer, increased access to credits and ability of the farmers to produce beniseed that commands higher prices (or manage product sales at higher prices) are factors that significantly enhance overall economic efficiency in beniseed production in the study area. This is in line with the work of Bravo-ureta and Evenson, (1994) who found that credit has a positive impact on efficiency in their study of peasant farmers in eastern Paraguay.

The results also show that female farmers achieved significantly lower economic efficiency than their male counterparts. This is contrary to the work of Quisumbing *et al.* (1996) who were able to show in their study on male-female difference in agricultural productivity that female farmers are equally efficient as the male farmers. They suggested that areas where women are inefficient could be due to constraint by cultural factors from having more active roles and low levels of education and technical development. Farmers that cultivated leased land and larger farm sizes were also significantly less efficient than those that had property right on their land and cultivated smaller farm size respectively.

The decline in efficiency on the side of farmers that lease their land could be that the land leased to them may not be productive and they may not be willing to spend their resources to improve on the land since they are not the rightful owners.

The main import of these findings therefore, has been that significant economic inefficiencies (technical and allocative) exist in beniseed production in the study area. These inefficiencies can be significantly reduced if the farmers are granted greater access to credit, more extension contacts, access to better marketing channels (with supportive

technologies like storage and processing) while issues relating to granting property and fertilizer use. Use of herbicides significantly lowers technical efficiency (but not allocative or overall economic efficiency), rights to farmers on their farm land should be considered to enhance technical efficiency of beniseed farmers in the study area.

Table 4: Estimates of Tobit Model of Allocative and Overall Economic Efficiency

| Variables | Allocative Efficiency | | Economic Efficiency | |
|-------------------------|-----------------------|---------|---------------------|---------|
| | Parameter | t-value | Parameter | t-value |
| Constant | 0.1545 | 3.44 | 0.1561 | 3.75 |
| Age | 0.0008 | 1.27 | 0.0009 | 1.61 |
| Sex | -0.0723** | -2.39 | -0.0552** | -2.28 |
| Education | -0.0011 | -0.78 | 0.004 | 0.32 |
| Farm size | -0.0046 | -0.21 | -0.0069 ** | -2.02 |
| Leased land | -0.0284 | -1.46 | -0.0399** | -2.22 |
| Mixed cropping | -0.0285 | -1.04 | - 0.0097 | -0.42 |
| Seed type | 0.0215 | 0.96 | -0.0083 | -0.39 |
| Tractor | 0.0262 | 1.45 | -(0.0004) | -0.08 |
| Fertilizer | 0.0858 *** | 4.58 | 0.0591*** | 3.39 |
| Herbicide use | -0.0208 | -0.92 | -0.0311 | -1.49 |
| Credit | 0.0001 | 0.93 | 0.0002* | 1.87 |
| Extension visit | 0.0117* | 2.50 | 0.0032 | 0.73 |
| Price | 0.0018*** | 17.14 | 0.0005 *** | 4.48 |
| Diagnostic parameters | | | | |
| Sigma | 0.1039 | | 0.096 | |
| Log likelihood function | 164.75 | | 179.19 | |

Source: Computed Survey Data (2006)

Note: *P Significant at 10%, **P Significant at 5%, *** P Significant at 1%

CONCLUSION AND RECOMMENDATIONS

On the basis of the above findings, the study concludes that significant economic inefficiency exist in beniseed production in the study area. These are related to the inadequate access of the farmers to appropriate physical and human capital like fertilizer, credits, extension contact, as well as appropriate marketing channel and associated technologies for harvest, storage and preservation as to enable them to sell their products at reasonably high prices.

The study therefore, recommends that, extension services should be strengthened so that farmers would be made acquainted with the efficient use of the available resources. At least extension agents should visit a farm household twice in a month in order for him to serve as a guide towards adequate management of beniseed farm for better productivity.

More agro-service centres should be established by governments, with enabling environment created for significant private sector participation, so as to give farmers greater access to critical inputs like fertilizer, tractor services, improved seed, the absence of which have been found in this study to hinder efficiency in beniseed production.

Improved beniseed production should be funded and disseminating centres established where farmers can fall back for regular seed supply. The seed should be sold at subsidised rate. This will guarantee availability of products that will attract high market value.

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A COMPARATIVE STUDY OF FARMERS' USE OF EXTENSION GUIDE/BULLETIN AND RADIO AS MEDIA OF AGRICULTURAL INFORMATION AND TECHNOLOGY TRANSFER IN OGUN STATE, NIGERIA

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ABSTRACT

The study compared farmers' use of extension guide and radio as media of agricultural information and technology transfer in Ogun State. A multistage random sampling technique was used to select 320 farmers from 32 villages in the four agricultural zones in Ogun State. Data were collected with an interview guide. Pearson Product Moment Correlation and Chi-square were used to test the study hypotheses. Findings showed that 59% used radio while 7% used extension guide as media of agricultural information. Farmers were constrained by illiteracy, lack of fund, feedback problem, lack of electricity, bad eye sight and language barrier. There is a significant relationship between farmers age, sex, marital status and their use of radio and between farmers' sex, education and their use of extension guide. It was recommended that farmers should be encouraged to listen to farm broadcasts, read and adopt the content of extension guide and that, farm broadcasts and publications should be planned in conjunction with the extension agents to address the felt needs of the farmers.

Key words: Extension guide, Radio, Media, Agricultural information, Farm broadcasts.

INTRODUCTION

Effective agricultural communication involves the dissemination of appropriate technologies to the users who comprise mostly of farmers and other stakeholders in agriculture. Technologies and innovations developed must get to the end users through appropriate media. Extension guide/bulletin is one of such media through which agricultural knowledge is imparted to farmers. Its use bears considerable implications for the actual practice of learning and training of farmers. It tends to ease the understanding of a problem through reading. It is being employed as a support medium to complement the efforts of the various

Agricultural Development Programmes (ADPs) field staff at reaching the literate small scale farmers in Nigeria. On the other hand, Radio has been recognized to be a veritable means of mobilizing the rural dwellers towards meaningful development. Oso (1993) posits that the mass media strive not only to inform and educate, but also motivate the people and secure participation in the rural development process. These objectives are mostly achieved by the broadcast media because of the following advantages ascribed to it in form of:

- i. transcending the barriers of illiteracy
- ii. demanding less intellectual exertion than the print media message