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A Bivariate Analysis of Factors Affecting Rice Processing in Igbemo-Ekiti, Nigeria

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Abstract: A major problem with the domestic output of rice in Nigeria is the poor operational techniques of processors which often aid low production. Efforts of government through the Agricultural Development Project (ADP) to improve rice processing especially in Ekiti State have appeared ineffective. This study therefore, examines the basic factors affecting rice processing in Igbemo-a major rice producing town in the state. Seventy two processors (respondents) were interviewed in 21 residential quarters of the town. The study employed the chi-square (χ^2) test of the processor's variables. Findings discovered strong relationship between: sex of Processors, their income, training acquired before commencing work, type of processing activities carried out and the number of workers engaged in processing. Others include; the mode of processing, access to raw-material (rice), expenditure on processing, institutional assistance offered to processors and availability of storage facilities at operation centres. Suggestions for policy adjustments are offered based on research findings.

Key words: Rice, processing, processors, Igbemo-Ekiti, Nigeria

INTRODUCTION

At this period of food security in Nigeria, food processing technology commands an interest greater than any developmental issue. Food security is a sensitive problem facing many nations, especially the developing countries due to their ever increasing population (Ajake, 2003). In highlighting a report by the United Nations Research Institute for Social Development (UNRISD), the concept of food security is described as sustained and assured access by all social groups and individuals to food adequacy in quantity and quality to meet nutritional needs (Esu, 2003). Nigeria, is currently witnessing reduction in importation of food products, particularly rice. Major suppliers (Indian and Thailand) of the product have suspended further exports for food security in their own countries. What is required at the moment, is prompt intervention in rice production in Nigeria.

Rice is a staple food in many developing countries (Hauser, 2003). The average Nigerian, for instance, consumes 21 kg of rice per year (WARDA, 2002). Nigerians prefer the local rice because of its taste and even its smell (Longtau, 2000). Apart from the qualitative deficiencies of the rice such as presence of pebbles, chaffs and broken grains which most consumers attribute to the processing methods, the product is in short supply. In reality, the demand for the local rice is higher in the urban than rural areas because of higher population. To the urban households, however, both quantity and quality of the rice have become priorities. Igbemo rice has gained very wide recognition despite the low quality of the product. The noticeable problem now is that, the processing activities (parboiling, drying and milling) are of small-scale where specific skills and technologies are lacking.

Rice contributes tremendously to the economies of many nations. Available record (Encarta Premium Suite, 2004) reveals that rice is important to the economy of the united States (the largest exporter of rice in the world) and Southern Europe where it is a major source of revenue. It is a staple diet in Japan and the principal crop in India (the 2nd largest world rice producer after China and Indonesia) where annual rice yields exceed 40 million metric tons. Thailand depends considerably on its rice production as the 2nd largest exporter of rice in the world. Vietnam considers it as the mainstay of its economy (being the 3rd world exporter) where the tropical climate supports 2 rice seasons per year. Rice is also a staple crop throughout West Africa, especially in Cote d'Ivoire, the Gambia, Guinea, Guinea Bissau, Liberia, Burkina Faso, Senegal and Sierra Leone (NISER, 2002). Specifically, the production from Guinea-Bissau, Sierra Leone, the Gambia, Senegal and Nigeria accounts for one-tenth of all rice production in Africa.

It is obvious that most of the rice producing nations in America, Europe and Asia engage in massive exportation. Despite the high production in Africa, exportation is difficult. Two reasons explain this. One,

Africa nations are characterized by huge population with rapid rates of annual growth (2.8-5.3%). Two, there is excess demand of rice over supply in these nations on account of high population growth and high rates of urbanization. Out of the 90 million people added each year to the world population, 84 million live in the 3rd World (Brown and Kane, 1995).

Nigeria, the most populous country in Africa, with over 130 million people, constitute about a quarter of the continent's total population (NISER, 2002). With a modest population of 18.7 million in 1921, the country's population ballooned to 88.5 million in 1991 (World Bank, 1995). The urban population was put at 20% in 1970, 23% in 1984 (United Nations, 1984), 38% in 1991 (Onibokun, 1992), 40% in 1996 (Alausa, 1997) and 60% by 2010 (World Bank, 1995). At annual growth rate of 5.3%, the urban population will double in 2010 (Yacoob, 1997). In view, of the rising rate of rural-urban migration in Nigeria and the high tendency for increasing demand for the local rice at the urban centres, improvement in rice processing in Igbemo becomes pertinent.

MATERIALS AND METHODS

Research locale: The research was carried out in Igbemo, Ekiti State, Nigeria. It is a major rice producing town. It locates between longitude 5°23 and 5°24 East of the Greenwich Meridian and Latitude 7°41 and 7°42 North of the equator. It lies within an upland zone rising over 250 m above sea level. The Yorubas mainly populate the town. Politically, it situates with Irepodun-Ifelodun Local Government Area (LGA) and Ekiti Central Senatorial District of Ekiti State. In recent years, Igbemo town has experienced a progressive increase in population due to natural increase and immigration from other towns. By the official population count in 1991, Igbemo ranks 3rd (with a population of 15,739) of the 11 major settlements in the LGA, after Igede (24,607) and Iyin (25,931). The projection to the year 2005 by the Department of Population Activities, Cabinet and Special Service, Ekiti State Governor's office, Ado-Ekiti, still retains Igbemo in the 3rd position (23,024) after Igede (35,996) and Iyin (37,931) out of total projected population figure of 161,286 for the entire LGA.

Database description: Empirical data were collected by the use of questionnaire. The research took a census of the 72 rice processors in the 21 residential quarters (compounds) which are coterminous with the Independent National Electoral Commission (INEC) political wards in the town. The wards are well-defined Data Delineation Areas (DDAs). In each ward, an identified processor, who was the head of a processing unit and of age 18 and above, was interviewed. Total survey was preferred because the respondent were few. Out of the 72 rice processors within Igbemo, 62 (86.1%) were parboilers who double as dryers, while 10 (13.9%) were millers. Research analysis focused on these 2 groups being the targeted population (rice processors). The variables that were employed in the analysis are: sex of the processor (Sex), income of the processor (Income), training acquired before commencing work (Train) and type of processing activity carried out (Activity). Others include; number of workers engaged in processing (Worker), the mode of operation of processor (Mode), the source of raw-material (rice) processed (Raw-mat), expenditure on processing (Expdt), the institutional assistance enjoyed (Assist) and availability of storage

Table 1: Chi-square (χ^2) relationship of processors variables

Variable code	Sex	Income	Train	Activity	Worker	Mode	Raw-mat	Expdt	Assist	Store
Sex	0.00	10.85*	5.03*	0.02	7.68	25.29****	0.51	11.22*	2.21	0.05
		(4)	(1)	(1)	(3)	(1)	(1)	(4)	(1)	(1)
Income		0.00	5.78	2.54	5.54	4.93	5.35	50.91****	2.56	1.41
			(4)	(4)	(12)	(4)	(4)	(16)	(4)	(4)
Train			0.00	0.09	4.88	17.50****	2.90	11.84*	39.48****	1.48
				(1)	(3)	(1)	(1)	(4)	(1)	(1)
Activity				0.00	16.14**	1.38	0.00	0.85	0.55	0.11
					(3)	(1)	(1)	(4)	(1)	(1)
Worker					0.00	31.16****	8.67*	8.25	1.00	9.77*
						(3)	(3)	(12)	(3)	(3)
Mode						0.00	14.59****	13.45**	7.72**	7.46**
							(1)	(4)	(1)	(1)
Raw-mat							0.00	9.00	1.48	3.14
								(4)	(1)	(1)
Expdt								0.00	6.25	6.10
									(4)	(4)
Assist									0.00	0.77
										(1)
Store										0.00

Decrees of freedom are in miniature parentheses; * Relationship is significant at 0.05 level; ** Relationship is significant at 0.01 level; **** Relationship is significant at 0.000 level; Source: Author's Fieldwork, 2007

facility (Store). These variables have been selected because of their likelihood to impact the processing of rice in Igbemo. Data analysis utilized the Chi-square (χ^2) test to match the variables with one another to observe a pattern of rice processing in the town (Table 1).

RESULTS AND DISCUSSION

It is possible to determine the operations of these processors through field observation. Another option, though less reliable, is to present only the opinions of the processors on processing of the local rice. The logic in the cross-tabulation of the specific variables is that, the rice processing activities require some inputs (materials, labourers and skills) which satisfy the quantitative and qualitative needs of consumers in production.

The bivariate analysis reveals that income of the processor (Income) is significant to their sex (Sex). Actually, the females (59.7%) that outnumber males in rice processing in Igbemo, suffer set-back in terms of access to institutional sources of capital such as banks. The predominance of women in this study can be attributed to 2 principal reasons. First, entry qualifications into the business are easiest for women as a common feature of women's household activities. Second, amount of equipment and capital needed to go into rice processing (particularly parboiling in which 86.1% are involved) is minimal.

Majority of the processors (82.0%) hold les than primary school certificate. This explains the relationship between training (Train) and sex. It is obvious, women dominate the rice processing scene in Igbemo. As expected in Nigeria, most women get married before their 20 birthday (Makinwa-Adebusoye, 1991). Their low level of education coupled with early marriage make them vulnerable to training, hence, the difficulty in comprehending the complexities and technicalities involved in processing. Given the difficulties involved in the local processes where there are no steepling tanks for soaking and boiling and autoclaves for drying, employment of workers (Workers) becomes significant to processing activities (Activity).

The mode of operation (Mode) of the processors has associated strongly with sex, train and worker. The significance of sex to mode is apparent. In the processing study, especially parboiling and drying, workers hardly exert great deal of energy in the activities, thus, are paid less (usually ₦200.00-₦300.00 day^{-1}). This low-payment does not appeal to most men, a situation that makes the engagement of female (Sex) dominant and significant. Train is significant to mode from an important point of view. About 95.8% of the processors lack formal training. A processors who lacks training and technical know-how in processing stands the risk of producing poor quality and low production. In Igbemo, the major problem faced by the processors is technology in processing which requires large investment and skills by highly trained specialist. The researcher had earlier observed the dominance of manual operation (86.1%) in processing. This, in most cases, maximizes labour utilization and is suggestive of he particular importance of wokers to mode.

The raw-material used in processing (Raw-mat) is absolutely related to mode because both the parboilers and millers depend on the availability of the paddy for their operations. That Raw-mat comes mainly from personal harvest (56.9%) and other rice farmers (43.1) underlines the significant relationship between Raw-mat and mode. The partial dependence on self harvest, leads to the use of additional workers to gather more paddy for regular operations as indicated by the significant association between Raw-mat and worker.

The expenditure on processing (Expdt) is significant to income, mode, sex and train. In Igbemo, the processor expend on 3 major area which are: procurement of paddy (if processor is not a rice farmer, or when processor's personal harvest is inadequate), employment of workers and maintenance of machine (if processor is a miller). Most of the processors are of low income (97.2% earning below ₦80,000 or $640 annually). It thus implies that lack of adequate capital (Income) to meet the necessary expenditure in this study, is a significant factor. Closely linked with this is the manual mode of operation (Mode) by 86.1% which, apart from being crude and outmoded, is grossly inefficient, time consuming and expensive.

It is evident that the employment generating potentials of rice processing in Igbemo is in favour of women. Unfortunately, this particular sex remains the poorest class of rural dwellers (Makinwa-Adebusoye, 1991) and the educationally disadvantaged group (Alonge, 2004), who are less responsive to training. That most of these processors have no formal business training (95.8%) exposes them to high expenditure, the basis on which sex and train are significant to expdt. The assistance granted to processor (Assist) only tends to be associated with train and mode. Available evidences show that, processing techniques for rice products in Igbemo are still overwhelmingly traditional (86.1%). This, coupled with inadequate training of processors account for the absolute relationship between these variables.

Contrary to popular expectation, only 73.6% of the processor have storage facility (Store) which exhibits considerably high relationship with mode and worker. However, a significant proportion of the processing enterprises are one-man show, operated form home

(97.2%) on a part-time basis. Only 13.9% go mechanized (i.e., the millers) with maximum production capacity of about 150-200 ton day^{-1}. In absolute term, this is exceedingly low compared to the 600 tons in Abakaliki, Ebonyi State and Lafia in Nasarawa State (NISER, 2002). Thus, the association between store and mode is not amazing. The few number of workers (Worker) commonly engaged in processing (none = 29.2%, 1-2 workers = 25.0%, 3-4 workers = 43.1% and 5-6 workers = 2.8%) is indirectly accountable for the few available stores and the small size of output per enterprise.

CONCLUSION

In this study, it is evident that some associated factors affect rice processing in Igbemo. The study has used the questionnaire to source for data among the 72 rice processors in the town. It has adopted a total survey techniques to investigate the various cases. Data analysis shows that:

- Income and training of processors are significant to their sex.
- Number of workers engaged in processing are closely related with the type of processing activities carried out.
- Mode of operation of processor is of high relationship with the sex, training acquired and number of workers engaged in processing.
- The availability of raw-material (rice) for processing is determined by the engagement of workers and mode of operations of processors.
- Expenditure on processing is a function sex and income level of processor, the training acquired and the mode of operation.
- Assistance offered to processors is dependent upon the training acquired and also the mode of production.
- The provision of store correlates with the number of workers engaged in processing as well as mode of production.

Considering, the priority of rice production in this area, it represents a definite agropole to be designated for a special regional level planning by the Federal and Ekiti State Government. By this, the planning and management of the town specific project and development plans will be under a proposed State District Development Commission (SDDC)-an autonomous economic parastatal.

Apparently, there is a distinct pattern of sex-based division of labour in rice processing which is of negative effect on production. To promote high gender ratio in favour of men, the SDDC should introduce new techniques capable of mechanizing the rice processing operations. That is, steepling tanks for boiling and soaking, autoclaves for drying, dehusking for winnowing, polishing and mobile milling machines should be made available at subsidize cost by the SDDC for engagement of more male processors with reduced labour. With time, the SDDC can collaborate with Research Institutes such as Nigerian Institute of Social and Economic Research (NISER), Polytechnics and Universities of Technology to fabricate the processing plants locally with some imported components so that processors can easily acquire them. This will improve their mode of operation, accelerate the production efficiency with less expenditure and enhance the value of the final product.

The low level of education of the processors, underlines their lack of knowledge of modern food production. Government, through the SDDC must collaborate with stakeholders (Ministry of Commerce and Industry, Agriculture, Local Government etc.) and ensure that public enlightenment and training programmes (workshop, seminar, etc.) are conducted regularly on standard processing techniques to educate the group of producers on their obligations to the society in terms of safety and quality. By this, assistance to processors as well as mode of operations will be free from threats, particularly the technical know-how that can be adapted to meet the modern challenges of food processing.

This study, reveals the self-financing culture of the processors which is a barrier to their operational expenses and productivity. No doubt, majority (94.4%) are constrained by capital. On this note, granting of soft loans to the processors (irrespective of sex) by the state government through the SDDC can be of tremendous help. Alternatively, the SDDC can organize Competition Fund (CF) by or with groups (4-5 people) of processors so that they decide on specific processing programmes with cost-sharing models based on individual contributions to the project under a control mechanism. By so doing, processors can obtain returns on their investments, while reducing expenditure.

The local rice, undoubtedly, enjoys favorable market. That 73.6% of the processors lack storage facilities, therefore, is of serious concern. This, perhaps, explains why processing operations are delayed till around market days when traders rush and subject the rice to all forms of contamination. On this note, it is imperative that the Ekiti State Ministry of Commerce in collaboration with the SDDC constitute a Task Force that will ensure provision of storage facility of specific standard by the processors (parboiler, dryers and millers). Ban of operation should be made the penalty for a defaulter. Availability of store will

minimize post-harvest loss, engagement of workers on preservation of the rice and enhance mode of operation of the processors through steady supply and discharge of the rice.

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