ANALYSIS OF POST HARVEST LOSSES AMONG PLANTAIN/BANANA (*Musa Spp.L.*) MARKETERS IN LAGOS STATE, NIGERIA.

Adewumi, M. O., Ayinde, O. E., Falana O. I. and Olatunji, G. B.

ABSTRACT

Department of Agricultural Economics and Farm Management,University of Ilorin, P.M.B.1515, Ilorin, Nigeria.
E- mail: opeayinde@yahoo.com

This study focused on the economics of post harvest losses among plantain/banana marketers in Lagos state, Nigeria. The study described the socio-economic characteristics of the marketers; appraised the post harvest losses among the marketers; examined the costs and returns as well as the factors affecting post harvest losses of plantain/banana in the study area. The study revealed that majority of the marketers were female and there were more retailers than the wholesalers in all the markets studied. Almost all the marketers are literate with over 76% of them having secondary education. The bulk of the post harvest losses occurred among the wholesalers who procured their plantain/banana at farm gate in the villages. Post harvest losses were the significantly determined by the distance between the farm and the market, market experience, storage period, cost of storage and whether or not the marketers were members of a cooperative. Given the threat of plantain/banana glut during the on- season in the study area, it is suggested that the plantain marketers should form a viable cooperative society to cater for the marketing and storage of these farm produce within their locality.

INTRODUCTION

Plantain and banana (*Musa Spp. L.*), is a major starchy staples in the sub-Saharan Africa, providing more than 25% of the carbohydrates and 10% of the daily calorie intake for more than 70 million people in the continent (IITA, 2000). Yields are highest in Western Africa estimated at 26.4 tonnes per hectare and lowest in Central region where it is estimated at 5.5 tonnes per hectare. Plantain/Banana constitutes the fourth most important global food commodity after rice, wheat and maize in terms of the gross value of production (CGIAR, 1992). Ripe banana is a good source of vitamin A and contains medium quantities of vitamin B and minerals like phosphorus, iron and potash. Ripe banana also contains sugars – sucrose, fructose and glucose. Plantain/Banana contains a type of protein called tryptophan, which the body converts into serotonin that helps us to relax. Though the protein content of banana is low, it contains an essential amino acid 'lysine', which makes banana an excellent complement in maize-based diets. The fruit is rich in potassium yet low in salt, making it suitable to control blood pressure.

Nigeria is known to be the world's largest producer and consumer of bananas (10.5 million tonnes annum^{-1}), accounting for approximately 10% of total global production (FAOSTAT, 2006). Production is however mainly by smallholder farmers with average plot size of 0.24 ha. FAO report (1995-1996) puts the national average yield for bananas at 14.9 tonnes ha^{-1}. In Nigeria, good quality banana/plantain is produced mainly during the month of October to February every year yet the demand for banana/plantain is all year round. Considerable research and extension efforts have been directed towards increased horticultural crop production in recent times and these have yielded results particularly in the northern part of the country, where increased yields are now obtained using irrigation. To enhance adequate supplies of banana/plantain, it is important that there be an efficient storage and marketing systems. The major problem of banana storage has been identified to be the decay caused by micro organisms which grow very fast tropical conditions (Lyman (2000). Profit in commercial fruit and vegetable growing depends on proper harvesting, handling and marketing following good production practices. Banana/ plantain marketers are known to give very rough handling and storage treatment to these fruits.

Banana production provides suitable options for subsistence and income generation not only in Nigeria but also in the East African mid- and high-elevation areas. Production has been dependent on own supplied inputs (mainly manure and crop residues), a method that recycles nutrients within the farming system, but does not add to the stock of nutrients in the system (Bekunda, 2000; Pender *et. al*., 1999). There is scarcely any use of artificial fertilizer in banana plots. Manure and mulch application has declined because of the increasing pressure on land that has impacted negatively on natural vegetation and pasture; hence the limited access to grass mulch and animal manure (Gold *et. al*., 2002). The low profitability of inorganic fertilizers (cost higher than benefit) explains the low adoption by farmers, which implies that major improvement in the market conditions facing Nigeria plantain/banana farmers is a prerequisite for substantial adoption to occur (Nkonya *et. al*., 2005). Moreover, limitations in the markets for some factors of production (e.g. credit) and output markets limit the productivity in agricultural production (Carter, 2004).

Too much of the world's food harvest is lost to spoilage and infestations on transit to consumers. In developing countries, where tropical weather and poorly developed infrastructure contribute to the problem, losses are sometimes of staggering proportions. Losses occur in all operations from harvesting through handling, storage,

processing and marketing (Jensen, 1996). Most often, post harvest losses are symptom rather than the problem. Knowledge of their cause is, therefore, essential for deciding measures to prevent them. Such measures may have to be taken by the small farmer, the private trader, the cooperatives, the marketing board or other operators, handlers and transporters, wholesale and retail markets, etc (Lynam *et. al*., 2002).

The focus of this study is the small marketers who produce much of the food in Nigeria and who often keep most of what they produce on the farm. Much of the work done in this area is on efficiency indices and little has been done to analyze the determinants of the post harvest losses. Thus this study described the socio economic characteristics of the plantain marketers in the study area; appraised the extent of post harvest losses among the marketers; examined the costs and returns to marketers and also identified the factors affecting post harvest losses of plantain in the study area.

METHODOLOGY

This study was carried out in Lagos state of Nigeria. The state is in southwestern Nigeria. Lagos is the Nigeria's largest city, chief port and principal economic and cultural center. It served as Nigeria's capital until 1991, when the seat of Federal Government was moved to Abuja. It has a very diverse and fast growing population, resulting from heavy and ongoing migration to the city from all parts of Nigeria as well as neighboring countries. The population for this study consists of plantain marketers in Lagos metropolis. The survey covered a total of 120 marketers from six randomly selected markets in Lagos State. Twenty marketers were randomly selected from each market. The information were collected using a structured questionnaire. Descriptive statistic, partial budgeting and Ordinary Least Square Method were the analytical tools employed for this study.

The value of post harvest losses of plantain (=N=) was fitted to the regression analysis using four functional models.

The regression function stated implicitly is:

$$Y = f(X_1, X_2, X_3, X_4, X_5, X_6, D_7, U) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (1)$$

Where:

Y = Post harvest losses of plantain measured in naira (₦); X_1 = cost of transporting the plantain to the market in naira (₦), ; X_2 = Average distance between the farm and the market in kilometer (km) on post harvest losses of the marketers; X_3 = cost of loading in naira (₦); X_4 = marketing experience in years; X_5= storage period measured in number of days, X_6 = cost of storage measured in naira (₦) ; D_7 = is a dummy variable representing membership of cooperation, 1 = membership and 0 otherwise, U = Error term

Four functional regression relationships: the linear, semi-log, exponential and Cobb Douglas forms were fitted. The lead equation was selected based on statistical, econometric and economic plausibility.

RESULTS AND DISCUSSION

The study revealed that 82 per cent of the plantain/banana marketers were female. The mean age of the marketers was 35 years with marketers in the age range (31-40years) constituting 75% of the total respondents. The respondents had an average of 15 years of marketing experience. The study also showed that about 82% of the respondents are full – time plantain/banana marketers. Others were part time plantain marketers but engaged in other occupations such as artisan and civil service work. About 49 per cent of the marketers were retailers and about 43% were wholesalers while 8.3% of the respondents played the dual role of wholesaler and retailer. Fifty-five percent of the wholesalers got their plantain from Edo state, twenty-seven percent from Ondo state and eighteen percent from Ekiti state.

Table 1: Post harvest loss of the plantain /banana wholesaler

Season	Average qty purchased (Kg/trip)	Qty sold (Kg/trip)	Estimated Net loss (Kg/trip)	Percentage of loss %
On season	12,500	11,673	827	6.62
Off season	12,500	12,187	313	2.50

Source; Field survey 2009

Table 1 show that the wholesalers bore about 6.62% of the total loss per trip during the on season and only 2.5% during the off season. The retailers bore little or no loss in the two seasons because they buy from the wholesaler and sell almost immediately within the same market. The retailer performs mostly the function of bulk breaking and easy reach to other smaller retailers and final consumers. The losses occurred due to the fact that the wholesalers have to travel to other states to purchase the banana/plantain. About 75% of the wholesalers identified poor

transportation system coupled with bad roads as the main cause of the losses they incurred while 40% attributed their losses to perishability and poor handling of the product.
Our analysis revealed that the average cost of a bunch of plantain to a wholesaler is N400, while the selling price per punch was N500. The marketing cost was estimated to be N15. The net wholesaler margin per punch was therefore N85. For a retailer the cost price was N500 per punch, the selling price was N600, the market margin was N100, with a marketing cost of N20, the retailer net margin was estimated to be N80 punch^{-1}.

Table 2: Regression results.

	Constant	X_1	X_2	X_3	X_4	X_5	X_6	D_7	R^2	F
Linear	313.906	14.536	623.550	8.851	_2.798	8.858E02	-682.643	7.523E02	0.662	6.154
	(0.253)	(0.509)	(2.470)*	(0.118)	(1-764)**	(1.937)**	(-2.600)*	(-2.058)**		
Semi log	-10553.383	1883.030	538.745	49.370	-3280.824	3621.211	-549.309	748.504	0.592	4.556
	(-2.117)*	(0.687)	(1.772)**	(0.035)	(-1.691)	(1.842)**	(-1.877)**	(1.000)		
Double log	0.408	0.769	3.300E-02	-0.403	-0.507	0.623	1.187E-02	0.162	0.288	1.271
	(0.256)	(0.876)	(0.339)	(-0.903)	(-0.817)	(0.990)	(-0.127)			
Exponen-tial	2.714	1.066E02	4.298E02	2.757E02	-22966E-07	2.187E04	2.904E02	1359E05	0.214	0.854
	(5.921)	(1.009)	(0.461)	(0.373)	(-0.018)	(-0.018)	(-0299)	(1.006)		

NB; the values in parenthesis are absolute value of t-ratio; (*) significant at 5%; (**) significant at 10%
Source: Computer analysis of field survey data 2008

Based on econometric and other criteria, the lead equation selected in Table 2 is the linear function. This function gave the highest R^2 **v**alue with the highest number of significant variables. The regression results showed that the significant variables account for 66.20% of the post harvest losses incurred by the marketers. The result showed that the average distance between the farm and the market, market experience, storage period, cost of storage and cooperative membership were highly significant factors influencing the amount of post harvest losses incurred by the marketers in the study area. Furthermore, the average distance between farm and market and the cost of storage were positively significant while the market experience, storage period, membership of cooperative were negatively significant to the variation in the amount of post harvest loss of the marketers.
The coefficient of average distance between the farm and the market (X_2) was significant at 5% level and positively signed indicating that the higher the distance, the higher will be the likelihood of the post harvest loss of plantain/banana. The coefficient of market experience (X_4) has a negative sign and was significant (p = 0.10). Marketing experience of the respondents is an important factor that explains variation in banana post harvest loss. With more years, the marketers seem to be better in the handling and storage of banana, hence the less the post harvest losses.

CONCLUSION AND RECOMMENDATIONS

Plantain marketing could be said to be profitable and there is presence of post harvest loss mostly incurred by the wholesalers. Losses incurred by the marketers are attributable to distance of source to market, storage period, marketing experience, poor handling, vehicle break down and perishability nature of plantain. It could be inferred that the problem of infrastructures; when improved upon could also be of benefit in the enhancement of the structure, conduct and performance of plantain market. For plantain/banana to be easily available at cheaper rate, the cost of transportation need be reduced to reasonable level. Encouragement must be given to the plantain marketers for them to buy in large quantity.
Given the threat of plantain glut during the on- season in the study area, it is recommended that the plantain marketers should form a viable cooperative society to cater for the marketing and storage of their goods within their locality. Also, effort should be made to provide storage facilities especially during transportation and within the market at an affordable price.

REFERENCES

Cigar, L. (1992) "Banana Plantain: It's use in traditional medicine in Cote d'Ivoire" *Proceedings of the 3rd meeting of IARPB.* Abidjan, Cote d'Ivoire. pp 170

Course,V., Cheftel, H., and Cheftel, J.C.(2003) " Introduction to Biochemical and Technology of Foods" Vol 1,Chap. 23. Technique and documentation. *Edition of modern enterprise*

FAOSTAT (2006) Food and Agriculture Organization of the United Nations. Production Yearbook. FAO Rome

Ferris, R.S.B., Oritz, R., Chukwu, U., Akalumhe, Y.O., Akele, S., Ubi, A. and Vuylsteke, D. (1997). The introduction and market potential of exotic black sigatoka resistant cooking banana cultivars in West Africa. *Quarterly Journal of International Agriculture*, 36: 141-152

IITA Annual report (2000) Project2, Improving Plantain and Banana based systems.

Lyman I.A. (2000). "Processing plantain chips in Honduras" *Proceedings of the 3rd meeting of IARPB.* Abidjan, Cote d'Ivoire, 27-31 May 1985. Pp162-163

Olorunda, J. (1999). Socio-economic researches on the conditions of the production of banana plantain in West Africa. *Fruits*, 43(1):186-188

Wikipedia (2008) Banana. http.www.wikipedia.com