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HOUSEHOLD-FOOD MARKET RELATIONS AND ITS IMPLICATIONS FOR FOOD SECURITY OF FARM FAMILIES IN IMO STATE NIGERIA

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ABSTRACT

The existence of markets is critical to the survival of the farm-household-family system and as such the nature of this relationship and how it affects the dietary supply of the household needs to be understood. The objective of this study is to examine the market relation of farm families by examining the degree of market orientation, the seasonal nature of market sales and purchases and their possible implications for food security. A total of 120 households were selected from the rural areas of Imo state using a multi-stage random sampling technique. The surveyed households were classified into Peri-Urban and Remote Farming Systems (PUFS and RFS) through a hierarchical clustering technique after the data were collected. Descriptive and comparative analyses were carried out using the Mann Whitney Test. The results showed that certain crops (cassava and yams) which command good prices and can yield high income were cultivated on a relatively large scale mainly for processing and consumption by the PUFS. The RFS on the other hand, did not have large outputs but sold about 40 percent of whatever they produced irrespective of its quantity in order to generate cash to meet other household needs. Farm families in the PUFS sold only 19 percent of their total output implying that they produced crops mainly for household consumption. It also showed that households in both systems had to buy food stuff from markets to meet household food supply needs at a period when they were likely to be cash strapped-the hungry season. As such, households compromised the quality of food stuff purchased during such difficult times; this was found to be particularly common in the RFS. At least 40 percent of households in both systems purchased and consumed broken or degraded items from the market during the hungry period. A seasonal intervention is required for short-term remedies while improving storage, processing and transportation facilities will in the long run improve market efficiency and give households better rewards in terms of income and purchased food prices.

Key words: Household, Market, Food Security, Systems

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INTRODUCTION

Nigeria is endowed with large tracts of arable land, people and capital resources to produce enough food for the population and for export. However, it depends on food importation which has not been able to close the food supply gap [1]. The rate of food importation increased from 8.5 percent of total importation to 12 percent between 1994 and 2004 [2]; it currently stands at 35 percent of total annual budget of the nation [3]. The average farmer upon whose backbone the agricultural sector thrives suffers from malnutrition and is vulnerable to erratic food supply, poor food quality and high food prices. Farming households were traditionally subsistent but the change in socio-economic/cultural and macroeconomic environment over time has created the need to generate income to meet other needs. Hence, food items produced are sold and then purchases are made later in the year to meet deficits at the household level. This implies that households have to operate in markets which are imperfect and inefficient in operations or lack adequate storage. However, the development in market orientation of farm families has not translated to prosperity for rural farmers, hence poverty and food insecurity is still a major issue. Huge amounts of money have gone into projects and programs to alleviate the situation with limited success [1].

Food insecurity is also associated with poverty [4,5]. The resource poor find it difficult to generate outputs that can fetch reasonable income and give room for savings after household expenditure on food and non food items have been made [5]. Though the Nigerian economy experienced growth of 6.99 percent in 2012 [6], it has not translated to the alleviation of poverty among rural households. This implies that macroeconomic recovery does not necessarily translate into significant social improvement. This has forced the Government of Nigeria and lending institutions to implement several policies and programs for combating food insecurity and poverty**.** Such programs include: Directorate of Food, Roads and Rural Infrastructure (DFFRI), Better Life Programme (BLP), Directorate of Employment (NDE); People' Bank of Nigeria (PBN); Community Bank (CB); Family Support Programme (FSP); Family Economic Advancement Programme (FEAP); Poverty Eradication Programme (PEP); National Poverty Eradication Programme (NAPEP); and National Economic Empowerment Development Strategy (NEEDS). The menu of food security and poverty alleviating strategies cannot be said to have reached the core poor and brought a lasting solution to the farm families [1]. A major reason could be the fact that a holistic view of the farm family's situation is not taken. A twin-track approach to alleviating hunger and poverty has been argued [7]. Whatever the approach may be, what is required is a basic understanding and information on household food supply in terms of own consumption and market purchase; an understanding of the periods when households are vulnerable to high food prices and at what periods would a cushioning intervention be best. Previous studies [8, 9] have been carried out to supply similar information but they focused on market orientation with respect to the comparison of food groups or just on one sector without giving attention to the differences in location and asset base.

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This study closes the gap by using a systems approach which views the farm-family-household as a system. The farm family owns resources and has to make decisions in line with their needs, objectives and problems; it has subsectors to which resources can be allocated and it has both internal and external relations [10]. Hence the Rural and Farming Systems Approach views markets as an important part of the external relations of the farm–household-family system. It considers it as being critical to the survival of the system because it is a viable enterprise. Also, the intensive relation with the market is defined by the problems and objectives of the farm-household-family system. These are usually quantified in terms of maximised family income or expressed as improvement in the living standard of the farm family since the objectives of the farm families are not restricted to the farm [10, 11]. If such markets do not exist or exist only partially, the growth and development of that system becomes stunted. Since markets are critical to the survival of the farm-household-family systems, then they are critical to rural development. Therefore, a market with specialized marketing services such as physical distribution, storage, grading and market information gathering is required for poverty alleviation, income inequality reduction and the mitigation of food insecurity situation at the family level [12]. However, the rural markets in Nigeria have not been able to perform these functions due to the imperfections in them. From the colonial era of the 1950s and since Nigeria's political independence in 1960, successive government administrations have made concerted efforts at improving agricultural marketing but they have not yielded the desired result of improving agriculture's contribution to Gross Domestic Product [13, 14, 15]. The poor understanding of the linkage between rural households' market relations and food security, or the poor implementation of ideas predicated upon such understanding, could be the reason why food planning and marketing efforts by the government has not yielded expected results.

Markets and marketing systems hold a tremendous opportunity to positively impact the social and economic lives of the farm families. This can be achieved by designing interventions based on sound research findings. This study investigated rural households' relationship with the markets in Orlu, Ehime Mbano, and Aboh Mbaise Local Government Areas of Imo state. Food insecurity and poverty are prevalent in the rural communities of Imo state and this explains the choice of the study areas. On the basis of the findings, this paper attempts to give some basic information which could form the basis for sound policy formulation. Hence, its objectives are:

- To examine the food items produced and the degree of market orientation with respect to each one.
- To examine the periods of overlaps in harvest, sales and food purchase period of the farm families.
- To examine household-food market relations with respect to food purchases
- To make policy recommendations based on the findings of the study.

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RESEARCH METHODOLOGY

The Farming and Rural Systems Approach was used in this study. The approach focuses on the analyses of the development of a system, the development of the solutions to the problems and measures the future impact of change on the system. That is, it provides the philosophy, the concept and strategy for developing and introducing solutions to decision making bodies at the micro, meso and macro levels. It views the farm-household-family system as an open one which has comprehensive and intensive relations to the outside world [10, 11, 16]. The family is identified as the smallest social unit that makes decisions on the allocation of family resources in line with their objectives and needs. This then informs the decision on what to purchase or sell in the market [16].

Description of the Study Area

The research was carried out in Imo State, south-east Nigeria. Imo State is one of the five states that constitute the south eastern region of Nigeria. The east occupies a land area of approximately 7,861,200 ha of land and has a population of 25,652,036 people [16]. This translates to an average land area of 0.31ha/ person [16]. Though the states are reasonably urbanized, majority of people live in rural areas. Imo State was chosen from the region based on the knowledge of the prevailing situation of poverty and poor food security situation. The state occupies a total land area of 5,530 km^2 and according to the 2006 population figures, 2,032,286 males and 1,902,613 females, that is a total of 3,934,899 people, live in the state. It has a population density of about 230 people per square kilometre. It is bordered by Abia State to the east, Rivers to the South and West and Anambra to the North. It consists of coastal lowlands to the east of Niger River. The state has original tropical rainforest vegetation. The state is known to be one of the low income states in Nigeria. The state has great potential for high income generation in the agricultural sector because it has the manpower and the natural resources required. However, it is known to experience food shortage since food production has been on the decline due to inefficient technology [17]. This research can enhance the achievement of a sustainable income increase by providing basic information for policy planning and design.

Data Sources and Sampling Technique

The farming and rural systems approach was used in the study. Imo state was purposively chosen because of the knowledge of the prevailing situation but a multi-stage random sampling process was used to select the final respondents. It is known to have 27 Local Government Areas based on its former geographical structure. Four local government areas were randomly selected, after which through the simple random process two villages were from each LGA. From the two villages selected, a total of 30 households were chosen using the simple random process. The total sample size was 120 households. The samples were drawn from the list of names (sometimes with addresses) obtained from the village leader or his representative. The survey was carried out with the use of a structured questionnaire though the administration was participatory in approach. The questionnaire was designed to give information on

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different aspects of respondents' lives such as income generating activities, socioeconomic data, production activities, household expenditure extra.

Methods of Data Analysis

Two major farming systems were derived upon which the descriptive and comparative analyses are based. Mann-Whitney-U test was used to detect and quantify the farming class means differences. The Mann-Whitney test is a non-parametric test and is preferred because a normal distribution of quantitative variables cannot be assumed.

- **Peri-Urban Farming Systems (PUFS):** These are located in villages which are close to urban areas and cities such as Owerri and Umuahia with more possibilities for off-farm income. There are also major access roads to these villages. The population density is low compared with the other regions and they are relatively richer in terms of own resources.
- **Remote Farming Systems (RFS):** These are located in more remote areas and are densely populated. They are also relatively poorer than the households in the Peri-Urban Farming System.

RESULTS

Degree of Market Orientation

Relation of the household with the market is important in terms of exchange of resources. The household can buy or sell labour and food produce. Agricultural production in the study area is subsistent mainly because the bulk of what is produced is assumed to be consumed. The household, however, needs to meet some other obligations and, in order to get the cash for such, must sell farm produce or other own resources.

The term 'degree of market orientation' is used here to express the quantity of farm produce that is sold vis a vis what is consumed and given out. Table 1 shows the estimated quantities of what was produced and sold at various markets. Sales are represented as a percentage of quantity produced. The PUFS produce cassava and yam in large quantities most of which are consumed (8 and 2.5 percent, respectively) while they sell a reasonable percentage of maize (46 percent), groundnut (67 percent) and palm oil (69 percent). The RFS, on the other hand, produce more varieties in smaller quantities and sell a relatively large percentage of each item. For example, over 50 % of the cassava and cocoyam produced and 45% of the palm oil processed by the RFS is sold in order to enhance the cash flow situation of the farm families; the percentage that is not sold is kept for household consumption but there is evidence that this quantity does not sustain the families throughout the production season. The differences in the degree of market orientation for the two systems differ in the roots, tuber and vegetables outputs. The RFS sell at least 42 % of these foods produced while the PUFS sell only 19 percent.

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Overlaps in Harvest, Sales and Purchases of Farm Produce

Figures 1 and 2 show the overlaps in harvest, sales and the peak periods when most of the households are making food purchases. The figures also indicate the percentage of families in each system that lives on a vulnerable threshold. Farm production activities kick off effectively in the month of April which coincides with the period of food and cash shortage. About 50 percent of the PUFS could be said to be market dependent at the least favourable period, which indicates a level of food insecurity. . The second peak period when PUFS purchase food is in the month of June when harvest would have started for short-cycle crops like maize, meaning that they are able to generate cash from early harvest and sales of maize for the purchase of other food items. This peak tapers off with increased harvest suggesting that they are able to meet more of food requirement from own production. It could also suggest that revenue from the sale of farm produce is used in the purchase of other non produced food items. The Remote Farming Systems have a similar pattern except that the peak period of April lasts a period of 3 months. About 35 percent of the families in the system are vulnerable in the month of April and the decline in the number of people in this situation takes a longer period. The RFS have more families making more sales though they are relatively poorer.

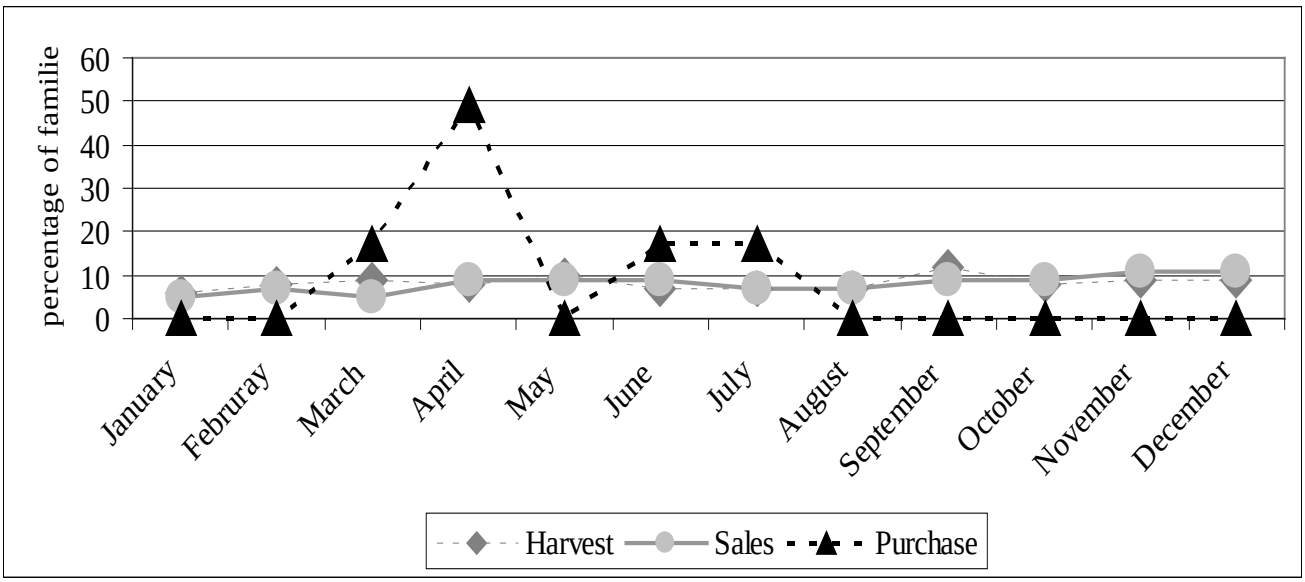

Figure 1: Overlaps in Harvest, Sales and Purchase Periods Peri-Urban Farming Systems

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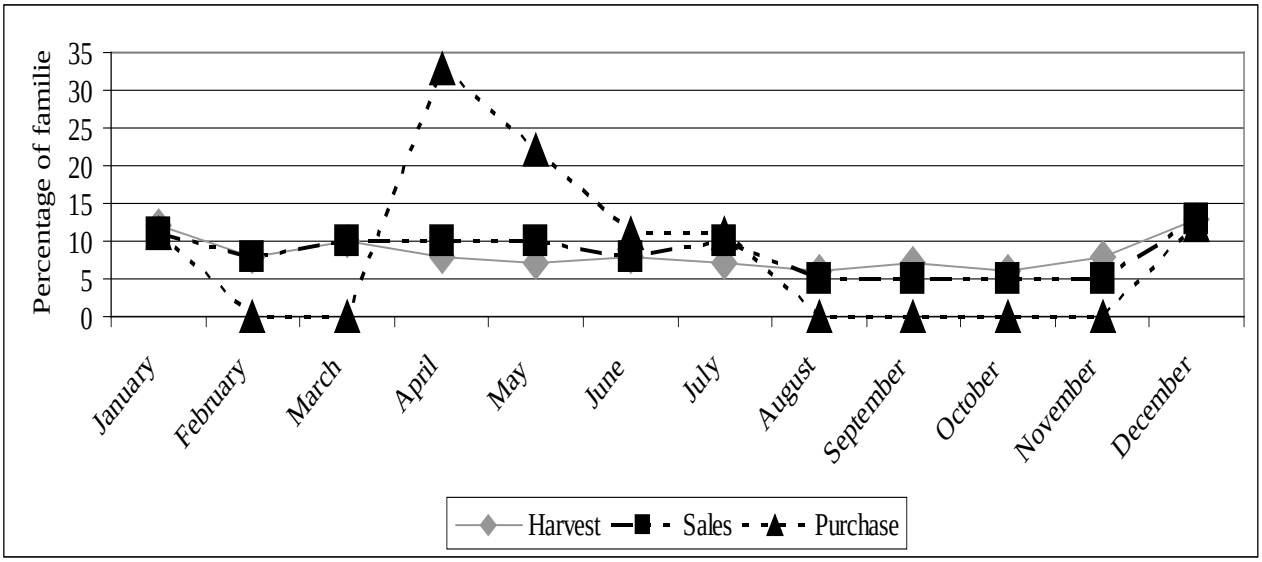

Figure 2: Overlaps in Harvest, Sales and Purchase Periods Remote Farming Systems

Food Supply and Food Security

The grade of food bought from the market is usually a mixture of good and mashed or broken, with more of the broken items being purchased by the Remote Farming Systems. Although the PUFs seem to be better off than the RFS, about eight percent of the families still depend on rotten or spoilt food items. Almost half of the households in the Peri-Urban Farming System depend on poor quality items such as broken, rotten or a mixture of broken and rotten ones (22 percent, 5 percent and 20 percent, respectively). The households in the Remote Farming Systems are more vulnerable with 47 percent of them depending on degraded food items. Apart from purchasing the food items which they also produce, other crops and food items which they do not process or produce form a major part of the purchases (Table 3). A comparison of the two systems shows that rice, milk, other beverages, yams and vegetables are major purchases during the production season. It also shows that the RFS depend more on the open market but spend less cash compared with the PUFS.

DISCUSSION

Degree of Market Orientation

In the study area, the linkage between the farm and household is still strong; crops produced are consumed or sold while those not produced are entirely purchased if required. Also animal protein is usually purchased from the market. The large quantities of cassava and yam produced and consumed by the PUFS gives the impression that they were produced mainly for household consumption. The sales of a large percentage of certain crops like maize may imply a tendency towards specialization in such crops. The main 'cash' generating products for the RFS are cassava, cocoyam and palm oil, judging by the quantities produced and sold; palm oil,

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maize and groundnut serve a similar purpose among the PUFS. The fact that items produced in minute quantities are also sold by the RFS could be an indication of financial pressure to meet other household needs. The result is in line with the findings of previous research which investigated the market orientation of rural households in Northern parts of Nigeria and found that the households sold their products to the market in order to raise cash and depended on the market for about 57 percent of food items consumed [8]. The study focused on food groups in the area unlike this study where specific food items were identified; the difference in household location and resource base was not considered. The specific items which are favoured by farm families for the market should be encouraged and further developed along its value chain. Also a study of market orientation of root and tuber crops in Imo State found that in the rural markets farmers offered over 70 percent of their root crops for sale, while noting that an average of 33 to 40 percent of all items produced were sold[9]. This study's result with respect to the remote farming systems agrees with the result that over 50 percent of root crop items are taken to the market in rural areas [8]. Their study, however, did not differentiate based on location and asset base. The studies agree that being market oriented could pose dangers of food insecurity in the short run though it would raise income and promises higher returns to labour and land.

Overlaps in Harvest, Sales and Purchases of Farm Produce

The near absence of basic storage facilities makes it pertinent for the farm families to sell farm produce as soon as they harvest. The critical periods when the two systems have food shortage problem run from March to July with April being the peak for most households. A three-fold pressure is indicated-the need to plant reserved seeds, the need to buy food and the need to buy other farm inputs and household needs. The month of April is generally considered the food insecurity month and the results indicate it. The June peak period for PUFS implies that households sell off purchases in order to get cash but alongside must supplement food supply. Since purchases taper off as soon as harvest starts, households may not obtain all the calories required. A cash pressure situation among the RFS is implied by the fact that most of them sell their produce. The overlaps as shown above agree with Lipton who stated that subsistence farms sell off much of their produce immediately after the harvest and steadily buy it back until the next harvest at higher prices; the higher prices induce them to produce more which leads to a glut at the period of harvest [18]. Contrary to this study, the author does not identify a specific period of vulnerability of subsistence farms.

Food Supply and Security

Since households have to make purchases and sell concurrently to the market at unfavourable prices, they may not be able to purchase quality food items. The amount and quality of food supply from farm as well as market are influenced by a number of socioeconomic factors. Such factors include family size, family cycle and ownership of productive resources; the need for cash may compel them to compromise the quality of food items purchased. This is reflected in table 2. This shows that food quality, safety and health are compromised because of the perennial poor financial

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status. The most vulnerable of the groups are those who depend on rotten and other forms of 'degraded' food items to meet their daily caloric requirement. Vulnerable families exist in the two farming systems and could be the target of economic empowerment programs such as farm input credit. The purchase of food items from markets (Table 3) underscores the importance of the market relations in the food supply and dietary needs of farm families. The PUFS appear to be self sufficient in terms of maize, yam and cassava production because few families depend on the market for its supply. On average, 50 percent of the households in the RFS have to depend on the market for major staples. Though the RFS seem to make more purchases the average amount spent per person is about 50 % of what the PUFS spend which indicates a critical food insecure situation.

Problems Associated with Storage, Processing and Marketing

The major crops that are stored in one way or the other are yams, maize or cassava. The means of storage include barns or stalls for yams while cassava is mainly stored underground.

Processing of farm output such as cassava and yam is an arduous task, consuming labour and time. Processing activities are limited because of the low technology available in the study area. In most cases, most of the crops are sold almost immediately after harvesting. Erratic power supply has not enhanced the introduction of cold storage for items such as vegetables which can be kept fresh and cool in it; they are most often sold as soon as they are harvested.

The products are transported using wheel barrows or bicycles depending on the distance and the quantity of produce. Hired vehicle transportation is used where the products are heavy, large and the market to be visited is far. This adds to the cost of the product and reduces margins. Daily markets exist but are not considered the major markets as they only serve emergency needs. Weekly markets prevail in the area, some are held on an eight days basis and others on 4 days basis. The farmer-traders rent stalls, which are simple sheds, at the different markets to house their wares. These are usually simple sheds with no safety precautions. Bad roads have contributed increased transportation, hence marketing cost, thereby limiting the farmer's ability to take advantage of better prices by going beyond the rural market.

CONCLUSION AND RECOMMENDATION

The research has shown that the degree of market orientation differs among farming systems. The poorer Remote Farming Systems are more market oriented not necessarily because they have market surpluses but because other needs for cash drive them to sell off their items quickly. The poor market infrastructural facilities compel households in both systems to run a concurrent harvest sale-and-purchase which is counterproductive because of the cyclical nature and the prices obtained at such periods. This relationship points out the tendency towards periodical food insecurity which can be chronic at the peak. It also suggests that the farm families may not be food secure at any period in the year. Also compromising food quality has health and

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nutrition implications for productivity and income generation capacity. The months of March, April and May are critical to the survival of farm families because the months represent periods when market dependence for household food supply is high while household income is low and food prices high.

A two-sided view is required for effective mitigation of the situation. On the market side, quality control in the food stuff market is required and the improvement of market/social infrastructure will enhance the capacity to store or process at a reduced cost. On the farm-family-household side, the health and nutrition education will over time help them insist on choosing good quality food stuffs; a seed bank and technological intervention will mitigate the tendency to sell off or consume what they have in a short period. In both cases, a state-private sector partnership in conjunction with the rural populace will enhance the delivery of the recommendations made.

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Table 1: Market Orientation of Food Items Produced by Rural households

			P-UFS n=54			RFS n=57
Crop	Produced Kg	Sales kg	(%)	Produced kg	Sales kg	(%)
Root and Tuber						
Cassava	765.88	60.25*	8*	**1026***	**600***	**58***
Yam	545.86	12.5	2.5**	445.28	85.26	19.1**
Cocoyam	6**	1**	2**	**57.87****	**29.39****	**51****
3 leafed Yam	8,82	2.6	29.5	9,17	0.67	7
Grains and nuts						
Maize	**311**	**142.26**	**45.7**	108.19	33.63	31.1
Ground Nut	**11.76**	**7.84**	**67**	9.63	3.70	38
Vegetables						
Melon	20.10*	1.63	8	**5.65***	**4.17**	**74**
Okra	1.08	0.12	11	2,07	0	0
Leafy vegetables	25.06**	7.33	29.2	61.31**	23.63	39
Pepper	0	0	0	**0.56**	**0.46**	**82**
Garden Eggs	0	0	0	**4.81**	**4.63**	**96.3**
Tree/Produce						
Palm Oil (litres)	**21.37**	**14.71**	**69**	**4.11**	**1.85**	**45**
Plantain	0	0	0	2.78*	0.26	9.4
Ave %			**19**			**42**

Notes* Significant at 90% confidence interval ** Significant at both 95% and 90% confidence interval All values in parenthesis are standard deviation All tests are Mann –Whitney tests

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Table 2: Quality of Grains and Vegetables Purchased by Rural Households

Item	Peri-Urban Farming System N=54 %	Remote Farming System N=57 %
Unbroken	50	43
Broken	22	10
Mixed	20	13
Rotten	5	22
Others	3	12

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Table 3: Market Supply of Food to Rural Households

Food item	P-UFS Amount in Naira	% of households making market purchase	RFS Amount in Naira	% of households making market purchase
Crops Produced				
Maize	184.12	19.6	100.28	40.7
Cassava R	260	19.6	454.07	40.7
Yam	972.35	54.9	658.33	70.4
Cocoyam	218.43	47.6	96.57	31.5
Plantain	419.22	41.2	213.89	44.4
Vegetables	2539.61	64.7	407.59	66.7
Items Processed				
Gari	662.94	52.9	508.11	63.7
Oils	464.51	58.8	307	55.6
Crops not Cultivated				
Rice	1637.84	80.4	955.37	83.3
Cowpea	438.43	29.4	174.07	33.3
Other grains	113.73	13.7	45.83	16.7
Others				
Meat/poultry/fish	2385.69	52.9	871.85	70.4
Milk	297.65	33.33	280	57.4
Drinks and Beverages	1195.59	49	199.07	24.1
Total (Naira)	12373.27		5,510.13	
Food Expenses Per person	229.13		96.66	

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