DETERMINANTS OF REVENUE AMONG SMALL HOLDER IRRIGATION VEGETABLE FARMERS IN IMO STATE OF NIGERIA.

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ABSTRACT:
The study on determinants of revenue among small holder irrigation Vegetable farmers was carried out in Imo State, Nigeria in 2011. Data were collected with structured and validated questionnaire from 120 small holder vegetable farmers in Imo State. Data was analyzed using descriptive statistics (mean, frequency distribution and percentages), and ordinary least squares multiple regression techniques. Results show that the mean age of the farmers was 45.2 years, mean household size was 9 persons, mean farm size was 0.40, mean farming experience was 7.3 and mean level of education was 6.9 years. The net revenue from small holder irrigation vegetable farming was N338,772.68 per hectare. The results of multiple regressions analysis show that the coefficient for farm size ,farming experience, level of education, farm income and extension contact were positive and significant at 1% implying that these are the key factors affecting determinants of revenue among small holder irrigation vegetable farmers in the area.
Keywords: Small holder, vegetable farmers, determinants, revenue, Imo State.

INTRODUCTION
The future and security of any country depends on its ability to produce a greater proportion of food required by its rapidly growing population (FAO, 2007). According to FAO (2006), agriculture is by far the greatest user of water accounting for over 85% of total use. It is estimated that less than 50% of potential agricultural land in Nigeria is presently cultivated due to inadequate water supply (Baba and Wando, 2005). Since majority of the poor in Nigeria depend on agriculture, increasing food production is among the principal means of combating poverty and malnutrition in Nigeria. Balogun [1986] defined irrigation as a system of agricultural production where surface and underground waters are harnessed to make up for the deficiencies in total volume of seasonal natural precipitation and/ or deficiencies in distribution of the precipitation over time and space. Contributing to the definition ,Odii [1998] explains that irrigation systems are techniques and technologies that capture ,distribute and add water to the soil to increase plant production.Increased vegetable production not only improves family diet but also increase family incomes especially income of women who often grow, preserve and sell vegetables (IITA, 2001; Ajayi and Banmke, 2005). Prevailing climate condition greatly influence the performance of vegetables that is the performance of vegetable is adversely affected during the dry season when weather is dry and hot which makes it necessary for supplement irrigation (IITA, 2003). The performance of individual farmer managed irrigation schemes in vegetable production and other food crops in some regions have proved very effective (Adewumi et al, 2005). If it is practiced in Imo State where the farming system and resources endowment favours small holder irrigation schemes, the results would not be different if not better. The output of leaf vegetables in Imo State is not keeping pace with the increasing demand for their use in dishes soups, sausage and edible packaging material (Oman and Grubban, 2007), leading to a shortfall in the recommended consumption of 85-113 gram of leafy vegetables per person per day (Matthew and Karikari, 1990). In view of this therefore, it becomes imperative to investigate the determinants of revenue among small holder irrigation vegetable farmers in Imo State. The study set out to achieve the following objectives:

- Examine the socio-economic characteristics of small holder vegetable farmers in Imo State.
- Determine the net returns earned by the farmers and

- Determine the factors affecting net revenue of small holder irrigation vegetable farmers in the area.

METHODOLOGY
The study was conducted in Imo State, Nigeria. The state comprises of three agricultural zones namely: Owerri, Orlu and Okigwe and subdivided into 27 Local Government Areas (LGAs). The state has land area of about 5,100.10 square kilometers (Imo State Statistics Year book, 2004) and estimated population of 3.7 million people (FGN, 2006). Agriculture is the major occupation of the people and food production is patterned by seasonal distribution of rainfall.

SAMPLE SELECTION
A representative sample was selected through a multi stage random sampling technique. Three local government areas in each of the three agricultural zones with the highest number of small holder vegetable farmers were purposively selected for the study so as to ensure vegetable farmers are dominant. From each selected LGA, one community with the highest number of small holder irrigation vegetable farmers was purposively selected, making a total of 9 communities. The sampling frame was the list of registered vegetable farmers in the communities with the Officials of Vegetable Producers Association (OVPA) Owerri office. From this sapling frame totaling 165 farmers composed of 70, 53 and 42 farmers for Okigwe, Orlu and Owerri agricultural zones respectively, proportional and random sampling technique were employed to select 50, 38 and 32 vegetable farmers from Okigwe, Orlu and Owerri agricultural zones respectively, giving a sample size of 120 farmers for the study.

DATA COLLECTION
Data were collected mainly from primary and secondary sources. The primary data were obtained through the use of structured and validated questionnaire, supplemented with personal observation. The secondary source from research reports, seminar papers, journals and conference proceedings, internet and other relevant literature.
Data were collected on variables such as socio-economic characteristics of vegetable farmers such as age, household size, farm size, farming experience and level of education. Data collection lasted for 3 months, between June and August 2009.

DATA ANALYSIS
Data were analyzed using descriptive statistics (mean frequency distribution and percentages) and ordinary least squared multiple regression technique were employed in the data. Descriptive statistics were used to analyze socio-economic characteristics while the ordinary least squares multiple regression model was used to analyze factors affecting net revenue of small holder irrigation vegetable farmers, the net income model was used to achieve net returns of farmers in the study area.

The ordinary least squares (ols) was used to analze the factors affecting the net revenue of farmers in the area .

$Y = F (X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_8, X_9, X_{10}, e)$

Where Y = net income of vegetable farmers (₦)
X_1 = Sex (1 male, 0 female)
X_2 = Marital status (1 married, 0 single)
X_3 = Age of the farmer (years)
X_4 = Household size (no. of person)
X_5 = Farm size (hectare)
X_6 = Farming experience (years)
X_7 = Level of education (no. of years spent in school)
X_8 = Farm income (Naira)
X_9 = Social organization membership (1 membership 0 non   membership).
X_{10} = Extension contact (number of visits)
e = Error term.

The Net Revenue model is specified as follows:
$NR = TR - TC$,
$TC = TVC + TFC$.
$NR = TR - (TVC + TFC)$

Where:
NR = Net Revenue
TR = Total Revenue
TC = Total Cost (TVC + TFC)
TVC = Total Variable Cost
TFC = Total Fixed Cost.

RESULTS AND DISCUSSION
Socio-economic characteristics of farmers in the area.
Table 1 shows that small holder farmers had a mean age of 41 years, this implies that small holder vegetable farmers are young people who are active and within the productive age group. This finding is similar to that of Audu and Abu (1999) who reported that people in this age group are the major workforce that can be productive. The mean level of education of 6.9 years suggests that small holder vegetable farming is in the hands of enlightened people in the area. It implies most of the vegetable farmers attended primary school while some attended secondary education, which is enough exposure to adopt improved practices in vegetable production. The mean farming experience of small holder was 7.3 years indicating that small holder farmers have acquired enough experience to engage

into profitable enterprises. This is consistent with the finding of (Nwaru, 2004) that the higher the farming experience the higher his knowledge to tackle farm production problems and the higher his output and income. Moreover, the mean household size of 9 persons was observed implying that the farm household have large labour force which leads to reduction in hired labour cost in vegetable production. The mean farm size of the vegetable farmers was found to be 0.40 hectare, which implies that the vegetable farmers are small scale operations with limited farm lands for vegetable production. This agrees with the previous findings that majority of farmers in sub-Saharan Africa are small holders of farm sizes of less than 6 hectares (Ogungbile and Olukosi, (1991) Nwaiwu, 2007).

Table 1: Distribution of the farmers according to their socio-economic characteristics.

VARIABLE	MEAN
Age (years)	45.2 years
Household size (No. of persons)	9
Farm size (Ha)	0.40
Farming Experience (Years)	7.3 years
	6.9 years

Source: Field survey data, 2011

Table 2: Multiple Regression Analysis on the factors that determine the net revenue among irrigation vegetable farmers.

From the results of multiple regression analysis in Table 2, the table shows that the exponential function produced the lead equation based on having the highest value of the co-efficient of multiple determinants (R^2), highest number of significant variables and conformity to a prior expectation. The co-efficient of multiple determinants (R^2) was 0.882 which produced and F value of 80.182 that was significant at 1% level implying that the model gave a good fit to the data. Also from the results, the co-efficient for farm size, farming experience, level of education, farm income and extension contact were positive and significant at one percent level while sex, marital status, age, farm size were positive and significant at five percent level. These show that they are important determinants of net revenue of irrigation vegetable farmers in the area. This implies that the higher they are among the irrigation vegetable farmers, the higher the net revenue. More so, the co-efficient of social membership were insignificant hence are not the determinant of net revenue in the area.

The R^2 value of 0.882 implies that 88% of the variation in net revenue of small holder irrigation vegetable farmers was accounted for by the joint action of the 10 independent variables included in the model.

The F- ratio of 80.182 is equally significant which indicates that the model gave a good fit to the data at 1% significance, the findings agrees with those of obinya (2004) in her study on Economics of dry season Telfairia occidentalis and obasi (2007) in his study on small holder irrigation agriculture in Enugu state Nigeria.

VARIABLE	EXPONETIAL
Sex (X1)	-0.005 (-2.403)*
Marital Status (X2)	0.004 (2.332)*
Age (X3)	-0.009 (-2.502)*
Household (X4)	-0.008 (-3.116)**
Farm size (X5)	0.008 (2.533)*
Farming experience (X6)	0.007 (2.615)**
Farm income (X8)	0.004 (3.183)**
Social organization membership (X9)	0.009 (1.313)
Extension contact (X10)	0.0074 (3.616)**
Constant	102.011
R^2	0.882
F –Value	80.182**
Sample Size	120

Source: Summarized from computer output, 2011
* t – ratios significant at 5%

** t and F – ratios significant at 1%

CONCLUSION

The study is on determinants of revenue among small holder vegetable farmers in Imo State Nigeria. The farmers earned net revenue of ₦338,272.68 per hectare which shows that small holder irrigation vegetable farming in the study area is profitable.

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