

## Gross Margin Analysis and Constraints Faced by Small Scale Rice Producers in the West Region of Cameroon

Raoul Fani Djomo Choumbou<sup>1</sup> I.U. Odoemenem<sup>2</sup> N. E. Oben<sup>2</sup>

1. University of Agriculture, Makurdi, Benue State, Nigeria. PMB 2373

2. Department of Agricultural Economics, University of Agriculture, Makurdi, Benue State, Nigeria. PMB 2373

### Abstract

This study was carried out to analyze gross margin and constraints faced by small scale rice producers in the West Region of Cameroon. A multistage stratified random sampling technique was used in selecting the respondents. A total of 192 small scale rice producers were purposively selected from four (4) out of eight divisions. Data were collected using structured questionnaires and interview schedule, administered on the respondents were analyzed using descriptive statistics. The Results indicated that an average small scale rice farmer obtained a gross margin of 67,000 fcfa per hectare despite high cost of fertilizer and agrochemical (16.82 percent); Poor marketing systems (13.55 percent); Insect and disease attack (13.28 percent); Poor infrastructure (13.28 percent); poor storage facility (12.84 percent); limited access to credit (11.78 percent); Lack of improved varieties of seeds (6.90 percent); land tenure system (6.73 percent) and lack of extension agents (4.78 percent) were identified to be the major constraints in small scale rice production in the West Region of Cameroon. However, to increase farmers' gross margin in the studied area, it is recommended that Agro processing industries should be established in the studied area with aimed at reducing the cost of fertilizers and agrochemicals.

**Keywords:** Gross Margin, Constraints, Small scale producers, Cameroon

### INTRODUCTION

Rice is the second most consumed cereal and half of the world's population depends on it for about 80% of their food calorie requirements (Braun, 2006; Bime *et al.*, 2014). The continued reliance of African consumers on rice imports is a potentially precarious and politically dangerous situation (FAO, 2000; Bime *et al.*, 2014). Cameroon is a typical agrarian economy in which agriculture and forestry sectors not only provide for more than 35% of the Gross Domestic Product (GDP) and 70% of employment for the majority of the population (FAO, 2006; Molua, 2010). Rice contributes a significant proportion of the food requirements of the population in Cameroon; production capacity is still far below the national requirement. To meet the increasing demand, the importation of milled rice is used to bridge the gap, and as a result, Cameroon spends at least 100 billion fcfa (about 209 million USD) yearly to import the estimated 500,000 metric tons of rice needed yearly for households (Djomo, 2014). Constrained by a doubling population, the per capital production has not kept pace with local and regional export demand. Rice producers and other stakeholders are concerned on the inadequate response of the sector (Piebeb, 2008; Molua, 2010). There is a rapid growth of the domestic market that constitutes an immediate opportunity for national production. Nevertheless, consistent decreases in rice production is due to several constraints including: (i) Lack of Extension Agents visit ; (ii) High cost of fertilizer and agrochemical; (iii) Insect and disease attack; (iv) Poor storage facility; (v) Poor marketing systems; (vi) Land tenure system; (vii) Limited access to credit; (viii) Poor infrastructures (road, water, etc.....) and (ix) Lack of improved varieties of seeds (Djomo, 2014). Consequently, the strategy for the development of rice production in Cameroon seeks to improve the productivity and competitiveness of local rice by mitigating these constraints to production. Though efforts are made by the Cameroonian government to empower smallholder farmers, Cameroon's agriculture has remained largely subsistence and entails large inefficiencies in resource allocation which is compounded in the face of competition from well-protected subsidized farmers in developed countries and trading partners (Kamgnia, 1997; Bamou and Mkouonga, 2003; Molua, 2010). Therefore, there is need to analyze gross margin and constraints faced by small scale rice producers in the West Region of Cameroon.

### CONCEPTUAL FRAMEWORK

#### Gross Margin Analysis

Gross margin analysis is one of the oldest and simplest analytical tools used in farm management. It has been used in a number of economic studies for analyzing the profitability of farm production practice. Gross margin as the concept of contribution from marginal costing has been used widely in farm management since 1960. Within agriculture, it is usually called gross margin or, sometimes profit. The basis of gross margin analysis is that the farm is seen as a group of independent, productive enterprise, centered on the farm unit, which provides common services and the necessary co-ordination (Johnson, 1990). Gross margin of the farm activity is the difference between the gross income earned and the variable costs incurred. For a farm undertaking several different activities, the total gross margin is the sum of the gross margin on each activity (Abbot and Makehan,

1992). The total revenue represents the volume of the output from the farm (e.g. physical quantity of the crop multiplied by the unit price), while the total cost is the total value of the entire farm input during a certain period of production. It is of two component parts fixed cost and variable cost. Fixed costs are those costs incurred on fixed inputs which do not change as production changes. The fixed costs is just in the short run because in the long run all costs become variable since conditions may warrant changing all the factors of production, on the other hand, variable costs are the short term costs of resources which last for less than one year. They vary according to output and are incurred on variable inputs which can attribute to specific enterprise (Olukosi and Ogungbile, 1982). Gross margin is the difference between the gross farm income (GFI) and Total Variable Cost (TVC). It is a useful planning tool in situations where fixed capital is a negligible portion of farming enterprises as in the case of small scale subsistence agriculture (Olukosi and Erhabor, 1988).

## EMPIRICAL REVIEW

### Gross Margin Analysis in Agricultural Production

Odoemenem and Inakwu, (2011) found that an average rice farmer earned a gross margin of 91,338.26 Naira in Cross River State, Nigeria. Owor (2011) found that gross margin analysis of soybean farmers in Benue State, Nigeria was 42,352 naira per hectare. Ani (2010) reported that profitability of food legume crops in Benue State, Nigeria was 18,959 naira per hectare. Bime *et al.* (2014) obtained a gross margin of 134484.9 fcfa/ha in their study on profitability and marketing channels of rice in Menchum River Valley of North West Region of Cameroon

### Constraints to Agricultural Production

Piebeb (2008) explained that misplaced priority, inconsistent policies, weak institutional setting, poor marketing systems, inconsistent agricultural input, deteriorating irrigation structures, Inappropriate Technologies for Production, gender disparities and inequality, environmental constraints, lack of sufficient quantities of improved seed rice, little access to credits, weak research support and inadequate training of farmers are the major constraints in rice production in Cameroon. Odoemenem and Inakwu, (2011) found that the major rice production constraints faced by farmers in Cross River State, Nigeria were inadequate capital (82.5 percent), high cost of labour (67.5 percent), inadequate supply of farm inputs (64.2 percent), land tenure system (63.3 percent), high cost of fertilizer (78.3 percent) among others. According to Singh and Moya (1997), disease and pests are important natural factors limiting the production of rice and in severe cases, account for about 100 percent crop losses. There are other constraints to sustainable rice production in Cameroon which include: Low temperature during off-season in irrigated areas, poor marketing Systems, deteriorating irrigation infrastructures, recently lack of input supply and credit due to reorganization of the public sectors, weak research support (www.waltersmunde.tripod.com).

## METHODOLOGY

**The Study Area:** The study was conducted in the West Region of Cameroon which has eight divisions namely: Bamboutos, Haut-Nkam, Mifi, Menoua, Khoung-khi, Nde and Hauts-Plateaux. The West Region covers a total land area of 14000 sq km and is located in the West-Central part of Cameroon within latitudes 5° 20' and 7° North and longitude 9° 40' and 11° 10' East of the equator (Yerima and Van, 2005).

**Population, Sampling procedure and Data Collection:** A sample of the population was taken by adopting a multistage stratified random sampling procedure. First, four divisions were purposively selected (Bamboutos, Nde, Noun, and Menoua) based on the high concentration of rice production in those divisions. The second stage involved selection of one subdivision from each of the selected divisions namely: Tonga in Nde division, Foubot in Noun division, Santchou in Menoua division, and Galim in Bamboutos division. In stage three one community in each of the selected subdivision was selected namely: Keneghang; Babitchoua; Baigom and Sekou. Having drawn the sampling frame of 2400 rice farmers in these communities collected from the West Regional Delegation of the Cameroon's Ministry of Agriculture and Rural Development, 8 percent of the producers' population was randomly selected in each community. Thus a total of 192 small scale rice farmers were selected for the study.

### Variable Specification/Model Specification

#### Gross Margin Analysis

Gross Margin is given as:

$$GM = TR - TVC$$

Where:

GM = Gross margin (fcfa/hectare)

TR = Total Revenue (fcfa/hectare)

TVC = Total Cost (fcfa/hectare)

#### t- Test Analysis

The *t* statistic to test whether the means are different can be calculated as follows:

$$t = \frac{\bar{X}_1 - \bar{X}_2}{s_{X_1X_2} \cdot \sqrt{\frac{2}{n}}}$$

where

$$s_{X_1X_2} = \sqrt{\frac{1}{2}(s_{X_1}^2 + s_{X_2}^2)}$$

Here  $s_{X_1X_2}$  is the pooled standard deviation, 1 = group one, 2 = group two.  $s_{X_1}^2$  and  $s_{X_2}^2$  are the unbiased estimators of the variances of the two samples. The denominator of  $t$  is the standard error of the difference between two means.

## RESULTS AND DISCUSSION

### 1-Gross Margin Analysis of Small Scale Rice Production in the West Region of Cameroon

The result in table 1 indicates that the mean cost incurred on labour is 143000 fcfa and constitutes 43.73 percent of the average total variable cost. The result further revealed that the mean cost of seeds (61000 fcfa) constituted 18.65 percent of the average total variable cost. The result also revealed that the mean cost of pesticides (11900 fcfa) constituted 3.63 percent of the average total variable cost. Similarly the mean cost of herbicides (29100 fcfa) constituted 8.89 percent of the average total variable cost and the mean cost of fertilizer (82300 fcfa) constituted 25.16 percent of the average total variable cost. The mean revenue is 394000 fcfa which means that an average small scale rice farmer obtained a gross margin of 67000 fcfa/ha. This value when compared with the value (134484.9 fcfa/ha) obtained by Bime *et al.* (2014) in their study on analysis of Profitability and marketing channels of rice in Menchum River Valley of North-West Region of Cameroon shows a decreases in profitability which may be attributed to inability of small scale rice farmers in the West Region of Cameroon to minimize cost incurred during the production process.

t-test result of gross margin analysis is presented in table 2. The result indicated that the mean total revenue is significantly higher than the mean total variable cost. This result implies that small scale rice production is a lucrative or a profitable business in the West Region of Cameroon.

**Table 1:** Descriptive Statistics of Cost and Return Variables of Small Scale Rice Farmers in the West Region of Cameroon

Statistics	Cost of Labour fcfa/ha	Cost of Seeds fcfa/ha	Cost of Pesticides fcfa/ha	Cost of Herbicides fcfa/ha	Cost of Fertilizer fcfa/ha	Total Variable cost fcfa/ha	Total Revenue fcfa/ha	Gross Margin fcfa/ha
Mean	143000	61000	11900	21900	82300	327000	394000	67000
Median	120000	59750	5000	21000	72000	280500	3.90E5	8.42E4
Mode	100000	70000	5000	13500	54000	355000	325000	-3E5
Standard deviation	9.488E4	3.75E4	2.139E4	2.798E4	5.972E4	20.156E4	15.441E4	24.163E4
Variance	9.00E9	1.40E9	4.57E8	7.82E8	3.56E9	4.06E10	2.38E10	5.83E10
Minimum	17600	5000	0	1500	0	56400	125000	-1.E6
Maximum	800000	36000	200000	250000	360000	1970000	1875000	1537600

Source: Field Survey, 2014

**Table 2:** Test of Equality of Total revenue and Total variable Costs (Gross Margin) of small scale rice farmers in the West Region of Cameroon

	t	df	Significance (2-tailed)
Equal variances assumed	3.645	382	0.000*
Equal variances not assumed	3.645	357.759	0.000*

Source: Field Survey, 2014 \* significant at 5%

### 2-Constraints Faced by Small Scale Rice Farmers in the West Region of Cameroon

Table 3 indicates the constraints of small scale rice production in the West Region of Cameroon. The result revealed that, majority of farmers are faced with the problem of high cost of fertilizer and agrochemical (16.82 percent) and this may be due to the fact that fertilizer, pesticides, herbicides and other agrochemicals used for

production are imported and therefore attracts more cost.

Poor marketing systems (13.55 percent) is another problem faced by farmers, this may be due to lack of statutory regulation which empowers middlemen to take advantage over farmers.

Insect and disease attack (13.28 percent) is another problem faced by farmers. The result agrees with the findings of Sight and Ahmad (1997); Odoemenem and Inakwu, (2011) who explained that diseases are important natural factors limiting the production of rice in several cases, and may account for 100 percent losses.

Poor infrastructures (13.28 percent) is another problem faced by small scale rice farmers and this may be due to the fact that rural areas are less developed.

The result further revealed that poor storage facility (12.84 percent) is another factor that hinders small scale rice production. This may be due to the fact that most farmers' houses are used for storage of their produce.

The result further showed that limited access to credit (11.78 percent) is another constraint in small scale rice production and this may be due to the fact that small scale rice farmers in the West Region of Cameroon do not have collateral security.

Lack of improved varieties of seeds (6.90 percent) and land tenure system (6.73 percent) are other constraints in small scale rice production. The low percentages are due respectively to the fact that government subsidizes and distributes high yielding varieties to farmers and also by the fact that most farmers are indigenes and have acquired their land through inheritance.

Finally, lack of extension agents (4.78 percent) is another constraint in small scale rice production. The low percentage may be due to the new orientation of the agricultural policy put in place by the government which usually post trained personnel in rural areas to work with farmers.

**Table 3: Constraints Faced by Small Scale Rice Farmers in the West Region of Cameroon**

Constraints	Frequency	Percentage (%)	Rank
High cost of fertilizer and agrochemical	190	16.82	1
Poor marketing systems	153	13.55	2
Insect and disease attack	150	13.28	3
Poor infrastructures	150	13.28	3
Poor storage facility	145	12.84	5
Limited access to credit	133	11.78	6
Lack of improved variety of seeds	78	6.90	7
Land tenure system	76	6.73	8
Lack of extension agent	54	4.78	9
Total	1129	100	

Source: Field Survey, 2014 multiple responses recorded

## CONCLUSION AND RECOMMENDATIONS

This Study was carried out to analyze gross margin and constraints faced by small scale rice producers in the West Region of Cameroon. The results revealed that small scale rice production is profitable in the studied area with an average gross margin of 67,000 fcfa per hectare despite the fact that cost of fertilizer and agrochemical were high (16.82 percent) and was identified as the major constraint faced by small scale rice producers in the West Region of Cameroon. It is therefore recommended that:

- Agro processing industries should be established in the studied area with aimed at reducing the cost of fertilizers and agrochemicals.
- Since small scale rice production is profitable in the studied area experienced farmers should also be encouraged to remain on the production process

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