



Research Article

Volume 6 Issue 3 – April 2017
DOI: 10.19080/ARTOAJ.2017.06.555686

Agri Res & Tech: Open Access J

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Effect Farm Management Practices on Performance of Smallholder Rice Farmers in Cameroon: A Case of the West Region of Cameroon



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Submission: March 07, 2017; **Published:** April 28, 2017

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Abstract

This study was carried out to analyse effect of farm management practices on performance of smallholder rice farmers in Cameroon: A Case of the West Region of Cameroon. A purposive, multistage and 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 multiple linear regressions. The result indicated that the linear functional form has the highest coefficient of determination (R²) of 0.978 implying that farming experience; farm size; rice variety; extension visit; credit received and rice output contributes to 97.8 percent of the variation of the performance of smallholder rice farmers. The result further revealed that coefficients for rice variety; extension visit; rice output; farming experience; farm size and credit received were found positive and significantly influenced the performance of smallholder rice farmers at 1 percent level of probability. This implies that increases in rice variety; extension visit; rice output; farming experience; farm size and credit received by unity will increase their performance by the value of their coefficients. It is therefore recommended that: experience farmers should be encouraged to remains in rice production as well as agricultural credit should also be made available at low interest rate in order to enhance smallholder rice farmers' performance.

Keywords: Farm management; Performance; Smallholder farmers; Cameroon

Introduction

Agriculture is the mainstay of Cameroon's economy and it satisfies the bulk of the population for food, raw materials for agro-industries and the export market. As a primary industry that provides employment for almost 72% of the Cameroonian population, agriculture is likely to remain the back-bone of Cameroon's economy for many generations to come [1,2]. The country's agricultural potential for food production is known to be immense and over 60% of its export earnings comes from this sector [2,3]. Rice is a strategic and political crop in many African countries. The hikes in rice prices since 2007 have shown the vulnerability of many African countries that depend on the world market for rice imports and the need to boost Africa's domestic production IRRI, 2013. Africa has sufficient land and water resources to produce enough rice to feed its own population and, in the long term generate export revenues. The

critical challenge facing the African rice sector is to enhance performance in production, processing, and marketing to respond to a major concern that needs to be turned into an opportunity: the growing demand for rice as a preferred staple IRRI, 2013. Although, 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) annually to import the estimated 500,000 metric tons of rice needed for households [4,5]. FAO [6]; Piebeb [7] and Djomo [5] reported that Cameroon was one of the countries that witnessed the most prevalent and frequent food import surges for the period 1999 to 2003, with rice identified as the most affected commodity. Given the

importance of rice in the Cameroonian economy, policy makers need empirical data to guide their development of suitable economic policy that would guarantee the improvement of rice production for the optimization of output and maximization of rice farmers' profit. Therefore, there is need to analyse effect of farm management practices on performance of smallholder rice farmers' in Cameroon: A Case of the West Region of Cameroon.

Objective

The main objective of this study is to analyse the effect of farm management practices on performance of smallholder rice farmers in Cameroon: The case of West Region of Cameroon.

Statement of hypothesis

Farm management practices have no significant effect on smallholder rice farmers' performance.

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 [8].

Population, sampling procedure and data collection

A sample of the population was taken by adopting a purposive, multistage and 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 sample frame was randomly selected in each community. Thus a total of 192 small scale rice farmers were selected for the study.

Variable specification/model specification

Multiple linear regressions: Four functional form such as linear function, semi-log function, exponential function and Cobb Douglas function were used to estimate the effect of farm management practices on smallholder rice farmers performance and the best functional form was chosen based on the highest R².

1) Linear function:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \varepsilon_i$$

2) Semi-log function:

$$Y = \ln \beta_0 + \ln \beta_1 X_1 + \ln \beta_2 X_2 + \ln \beta_3 X_3 + \ln \beta_4 X_4 + \ln \beta_5 X_5 + \beta_6 X_6 + \varepsilon_i$$

3) Exponential function:

$$\ln Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \varepsilon_i$$

4) Cobb Douglas function:

$$\ln Y = \ln \beta_0 + \ln \beta_1 X_1 + \ln \beta_2 X_2 + \ln \beta_3 X_3 + \ln \beta_4 X_4 + \ln \beta_5 X_5 + \ln \beta_6 X_6 + \varepsilon_i$$

A Priori expectation: $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6 > 0$

Where

Y is the performance of smallholder rice farmers (proxied to gross margin in fcfa per hectare)

X₁ = experience in rice farming (in years)

X₂ = farm size (in hectares)

X₃ = rice variety (improved variety=1 and local variety=0)

X₄ = extension visit (extension agent visit to rice farmers)

X₅ = access to credit (amount of credit received in fcfa)

X₆ = rice output (in kg/ha)

ε_i is a random error

Gross Margin is given as:

$$GM = TR - TVC$$

Where: GM = Gross margin (fcfa/hectare), TR = Total Revenue (fcfa/hectare), TVC = Total Cost (fcfa/hectare)

Results and Discussion

Effects of Farm Management Practices on the Performance of Smallholder Rice Farmers in Cameroon. The effect of farm management practices (farming experience; farm size; rice variety; extension visit; credit received and rice output) on performance of smallholder rice farmers in Cameroon is summarized in Table 1. The result indicates that the linear functional form has the highest coefficient of determination (R²) of 0.978 implying that farming experience; farm size; rice varieties; extension visit; credit received and rice output contributes to 97.8 percent of the variation of the performance of smallholder rice farmers. Table 1 indicates that rice variety; extension visit; farming experience; farm size; credit received and rice output significantly affect the performance of smallholder rice farmers. Specifically, the coefficients of rice variety; extension visit and rice output were found positive and significantly influence the performance of smallholder rice farmers at 1 percent level of probability. This implies that increases in rice variety, extension visit and rice output by unity will increase their performance by the value of their coefficients. Similarly, the coefficients of farming experience; farm size and credit received were also found positive and significantly influence the performance of

smallholder rice farmers at 5 percent level of probability. This implies that increases in farm size; credit received and farming experience by unity will increase their performance by the value

of their coefficients. The values of the coefficients are in line with the a priori expectation [9-11].

Table 1: Regression Estimates of the Effects of Farm Management Practices on the Performance of Smallholder Rice Farmers in Cameroon.

Variables	Linear+	Semi log	Cobb-Douglas	Exponential
Constant	-29578279	-3,140,000	4.594	11.977
	(-5.057)**	(-21.33)**	(41.55)**	(348.85)**
Experience (in years)	300.288	2395.98	0.004	23.872
	(1.98)*	-0.33	-0.766	-0.26
Farm size (ha)	1865.563	7146.337	5.405	678.001
	(2.10)*	(2.17)*	(2.12)*	(2.14)*
Rice variety (kg)	2400.172	9699.262	400.002	5675.001
	(2.61)**	(2.56)*	(2.67)**	(2.48)*
Extension visit	12.922	17.4	0.001	0.006
	(2.58)**	(2.60)**	-0.226	(2.33)*
Credit received (fcfa)	0.21	1289.925	-0.001	-2.61
	(1.98)*	-1.37	(-1.458)	(-0.03)
Rice output (kg/ha)	47.114	445410.94	1.039	0.003
	(83.85)**	(23.74)**	(73.83)**	(27.32)**
R ²	0.978	0.798	0.975	0.838
Adjusted R ²	0.977	0.778	0.974	0.832
F-Value	1,380,000**	118.58	1,190	159.044

F-value is equal to 1,380,000 and significant at 1 percent implying that farming experience, farm size, rice variety, extension visit, credit received and rice output have significant effect on the performance of smallholder rice farmers. Therefore, the hypothesis that stipulated that farm management practices have no significant effect on the performance of smallholder rice farmers is rejected.

Conclusion and Recommendations

This Study was undertaken to analyze the effect of farm management practices on performance of smallholder rice farmers in Cameroon: The case of West Region of Cameroon using multiple linear regressions. The results revealed that farming experience, farm size, improved rice varieties, extension visit, credit received and rice output have significant effect on the performance of smallholder rice farmers in the study area. It is therefore recommended that:

- a. Experience farmers should be encouraged to remain in rice production
- b. Improved variety of rice should also be made available during the planting period to farmers since it also increase their performance
- c. Agricultural credit should also be made available at low interest rate in order to enhance smallholder rice farmers performance
- d. Other farm management practices such as record keeping, source of labour, mode of farming as well as land acquisition

should be taken into consideration for further studies in order to give more insight on the effect of farm management practices on performance of smallholder rice farmers in Cameroon: The case of West Region of Cameroon.

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DOI: [10.19080/ARTOAJ.2017.06.555686](https://doi.org/10.19080/ARTOAJ.2017.06.555686)

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