

The Effect of Land Tenure Practices on Paddy Production in Nuwaragam Palatha East, Anuradhapura District

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Abstract

The objective of the study was to study the impact of security of land tenure on use of agriculture inputs and land productivity. This study examined the paddy land use in Nuwaragam Palatha East Divisional Secretarial Area of Anuradhapura district, Sri Lanka. It provides both qualitative and quantitative information about the prevailing paddy land in the study area. The survey covered from the random sample of 100 farmers from 29 Grama Niladhari Division. The multiple linear regression technique was used to identify the factors affecting the yield. This study confirmed that the productivity of owner cultivated paddy land is significantly greater than that statutory tenant cultivated paddy land and higher tenure security of agriculture land leads to higher productivity. It implied that the owner get 14.133 bushel per acre more than the statutory tenant cultivators when other factor was constant. It was found that the fertilizer was most important input in paddy cultivation. Owner cultivator applied large quantity of fertilizer per acre (133kg) than that of the statutory tenant cultivator (111kg).

Keywords: Land Tenure, Paddy Productivity, Tenure Security

Introduction

Land is the basic for each physical development and form the primary for food production, for the provision protection and utilities, for the manufacture the good. (Lasun, 2006) Hence, land is the most important asset for the farmers and it plays major role for increasing and developing the agriculture production.

However, ownership of land often interferes with its use as an agriculture asset. (Idoma & Ismaill, 2014) .The right of people to own, use and control and its resource are known as land tenure system. The term “tenure” is main concept for all human beings and it is an important part of the social, political and economic structure. The term tenure means the bundle of rights an individual, household or community may have with respect to land or water or other resources for that matter. (Nasrin & Uddin, 2011).

Productivity can be defined in various ways. In this study productivity means ability to produce valuable output for every unit of natural resource. (Michel, 1990)Productivity is measured in terms of yield or income per acre/hectare. The basic resource inputs are labour and capital. (Michel, 1990)Land tenure systems affect agricultural productivity by influencing the efficient use of inputs and adoption of modern technology.

There has not been much study on land tenure and land productivity in Sri Lanka. (Kotagama & Athukorala, 1995) Therefore in this research the principal focus is to determine the impact of land tenure on agriculture productivity especially in paddy sector. So it is not only significant to help the economic developer but also paddy farmer will be highly advantaged.

The purpose of this study therefore, is to identify the impact of security of land tenure on use of agriculture inputs and land productivity in Nuwaragam Palatha East.

Methodology

In order to attain the objective of this study, study focuses on Nuwaragam Palatha East divisional secretariats in Anuradhapura District in Sri Lanka. For the administrative purpose, this Divisional Secretariat was divided into 29 Grama Niladhari divisions and 72 villages. To do this, sample from each division is selected according to the systematic sampling. Total number of farmers was 1012 (2016) Literature was based for determining the sample size of the research. Required information for the study was collected from a simple random sample of 100 farmers from the study area. 50 owner cultivator and 50 tenant cultivator were selected for discussion and necessary data collection.

It is assumed that there exists a linear relationship between the yield of paddy land (Dependent Variable) and several independent variables. In these studies, there is not considered all the influential factors because it is hard to identify statistically some factors like farmer's skills and knowledge, soil condition and adaptation of the new technology. Some major factors were selected for the analysis assuming that all other factors are constant in the selected sample. The functional relationship between yield per acre and selected independent variable is established as follows.

Five independent variables are Extent of paddy land, amount of seed used per acre, amount of fertilizer used per acre, amount spend on weedicides per acre and amount spent on insecticides per acre. The functional relationship between yield per acre and selected independent variable is recognized as follows.

$$Y = f(X_1, X_2, X_3, X_4, X_5, X_6)$$

Y – Paddy yield per acre

X₁- Ownership (Dummy Variable, (Owner cultivator, Statutory Tenant Cultivator)

X₂ – Extent of the paddy land (Acres)

X₃ - Seed quantity used per acre (bushels)

X₄ - Quantity of fertilizer used per acre (kg)

X₅ – Cost on weedicides per acre (Rupees)

X₆ - Cost on insecticides per acre. (Rupees)

In order to identify the factors affecting the yield, multiple linear regression analysis was performed. Therefore there was an assumption that owner cultivated is authorized to the entire production of the land and appropriate amount of inputs which likely to give a higher production may be used by the owner cultivators. Therefore it is assumed that the per acre level of agriculture input applied by owner cultivator is higher than that by statutory tenant cultivators. For the determination of examine the impact of tenurial system of paddy land on use of agricultural input and to examine the impact of tenurial status of paddy land on productivity, hypotheses were formulated and tested

Result and Discussion

The data was analyzed using statistical analysis system package. Hence, regression analysis technique was conducted to find whether there is any relationship between yield of the paddy and other independent variable such as extend of the land, Type of Ownership, Seed Quantity used per acre, Amount spends on

weedicide per acre, and Amount spends on insecticide per acre, Amount of Fertilizer used per acre. It was resulted that there was the association between paddy yield and other independent variable.

The estimated beta value of the variable is given in the regression equation. (Equation 01)

$$\text{Yield} = 19.224 + 2.935 X_1 - 14.133 X_2 + 14.099 X_3 - 0.004 X_4 + 0.00 X_5 + 0.681 X_6$$

According to the equation 1, it meant that every independent variable increased, and then model predicts an increase of the dependent variable. The estimated parameters of the independent variables cost of weedicide and cost of insecticide were not significant. The estimated parameters of extend of the land, seed quantity, quantity of fertilizer and ownership were significant. In regression model, the regression co-efficient related to the ownership is -14.133. It implies that the owner get 14.133 bushel per acre more than the statutory tenant cultivators when other factor is constant. In regression model, the regression co-efficient related to the fertilizer is 14.099 bushels per acre for every additional one kilogram of fertilizer input provided that other factors are constant.

Impact on Land Tenurial System of Paddy Lands on Productivity

It is required to test whether there is any impact of tenurial system of paddy land productivity. Therefore following hypotheses was formulated. (Hypotheses 01)

H0: $\mu_1 = \mu_2$ Vs. H1: $\mu_1 \neq \mu_2$

Where,

μ_1 - The average yield of per acre owner cultivated paddy lands

μ_2 - The average yield of per acre tenant cultivated paddy lands

According to the two sample t-test, author has enough evidence to reject H0 and concluded that the average yield of per acre owner cultivated paddy lands is different from the tenant cultivator.

Table 1- Paddy yield classified by ownership

Type of Ownership	Mean	Std. Deviation	Minimum	Maximum
Owner Cultivator	113.86	6.037	100	130
Statutory Tenant Cultivator	83.64	5.724	80	101

The table 1 gives the detail of per of the paddy yield for owner cultivator and tenant cultivator. According to that, the yield for owner cultivator (113 bushels/acre) is higher than the statutory tenant cultivator. (83 bushels/acre)

Impact On Land Tenure On Use Of Agriculture Inputs

The entire production of the land is depending on the input which is used for that production. Therefore it is necessary to examine the impact of the tenurial system of paddy lands on the agriculture inputs.

Impact on tenurial system of paddy lands on use of fertilizer

At the interview it was found that the fertilizer is generally considered as the most important input in the paddy production by the farmers. Therefore it is required to test whether there is any significant difference

between the per acre fertilizer quantity applied by the owner cultivator and by the tenant cultivators. (Hypotheses 02)

H0: $\mu_1 = \mu_2$ Vs. H1: $\mu_1 \neq \mu_2$

Where,

μ_1 - The average per acre fertilizer quantity used by the owner cultivator

μ_2 - The average per acre fertilizer quantity used by the tenant cultivator

According to the two sample t-test, author has enough evidence to reject H0 and concluded that the average per acre fertilizer quantity used by the owner cultivator is different from the tenant cultivator

Table 2-Per acre fertilizer quantity applied classified by ownership

Type of Ownership	Mean	Std. Deviation	Minimum	Maximum
Owner Cultivator	133.574	1.53899	133	140.6
Statutory Tenant Cultivator	111.256	2.37643	110	120

According to the Table no 2 average, owner cultivator apply large quantity of fertilizer per acre (133kg) than that of the statutory tenant cultivator (111kg).

Impact on tenurial system of paddy lands on use of Quantity of seed used

It was required to test whether is any significant difference between the quantity of seed used per acre by the owner cultivator and statutory tenant cultivator. (Hypotheses 03)

H0: $\mu_1 = \mu_2$ Vs. H1: $\mu_1 \neq \mu_2$

Where,

μ_1 - The average per acre seed quantity used by the owner cultivator

μ_2 - The average per acre seed quantity used by the tenant cultivator

According to two sample t-test, author has enough evidence to accept H0 and concluded that the average per acre seed quantity used by the owner cultivator is not significant different from the tenant cultivator.

Table 3- Seed Quantity used per acre classified by ownership

Type of Ownership	Mean	Std. Deviation	Minimum	Maximum
Owner Cultivator	2.179	0.14141	2	2.58
Statutory Tenant Cultivator	1.862	0.08025	1.79	2

The table 3 gives the detail of per acre seed quantity applied by owner cultivator and tenant cultivator. According to the Table no 3 average, the average quantity of seed per acre by the owner cultivator is 2.179 bushels and that by tenant cultivator is 2.020 bushels. Therefore, it seems that the quantity of seed per acre used by farmers does not vary by ownership.

Impact on tenurial system of paddy land on use of weedicide

It was required to test whether is any significant difference between the average cost of weedicide used per acre by the owner cultivator and statutory tenant cultivator. (Hypotheses 04)

H0: $\mu_1 = \mu_2$ Vs. H1: $\mu_1 \neq \mu_2$

Where,

μ_1 - The average per cost of weedicide used by the owner cultivator

μ_2 -The average per acre cost of weedicide used by the tenant cultivator

According to the two sample t-test, author has enough evidence to reject H_0 and concluded that the average per acre cost of weedicide used by the owner cultivator is different from the tenant cultivator.

Table 4 - Per acre cost of weedicides classified by ownership

Type of Ownership	Mean	Std. Deviation	Minimum	Maximum
Owner Cultivator	4022	210.238	3800	4800
Statutory Tenant Cultivator	2889	111.708	2800	3300

The table 4 gives the detail average amount spent on weedicide applied by owner cultivator and tenant cultivator. According to the Table no 4 average, owner cultivator apply large amount of weedicide (Rs. 4800) than that of the statutory tenant cultivator.

Impact on tenurial system of paddy lands on use of Insecticides

It was required to test whether is any significant difference between the average cost of insecticide used per acre by the owner cultivator and statutory tenant cultivator.(Hypotheses 05)

$H_0: \mu_1 = \mu_2$ Vs. $H_1: \mu_1 \neq \mu_2$

Where,

μ_1 -The average per acre cost of insecticide used by the owner cultivator

μ_2 -The average per acre cost of insecticide used by the tenant cultivator

According to the Mann Whitney U Test under non parametric test, author has enough evidence to reject H_0 and concluded that the average per acre cost of insecticide used by the owner cultivator is different from the tenant cultivator.

Table 5 -Per acre cost of insecticide classified by ownership

Type of Ownership	Mean	Std. Deviation	Minimum	Maximum
Owner Cultivator	3020	90.351	3000	3600
Statutory Tenant Cultivator	2598	120.357	2500	3000

The table 5 gives the detail of per acre cost of insecticide used by owner cultivator and tenant cultivator. According to the Table no 5 average, owner cultivator apply large per acre cost of insecticide (Rs. 3600) than that of the statutory tenant cultivator (Rs.3000).

Conclusion

This study is showed that the mean value of the yield productivity of owner cultivated paddy land is considerably higher than that statutory tenant cultivated paddy land. Therefore productivity of the owner cultivated paddy land is significantly high. As well as owner cultivators used higher level of agricultural input. As a result of that higher tenure security of paddy land leads to higher productivity. It was also originated that there is no significant difference in quality of seed paddy land used per acre.

There is a lack of the practical published data on paddy land tenure and its implication. Further research is needed for making policy.

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