

# ANALYSIS OF PADDY CULTIVATION IN KANNIYAKUMARI DISTRICT USING DOUBLE LOG LINEAR REGRESSION MODEL

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**Abstract**— Sustainable development in Agriculture is a system of agriculture that is resolved to keep up with and save the farming base of soil, water and environment guaranteeing people in the future the ability to take care of themselves with a sufficient stock of protected and healthy food. The objective of sustainable agriculture is to develop farming systems that are productive and profitable. Also protect the environment and enhance health and safety, conserve the natural resource base, and to do so over the long-term. This study analyses the determinants of rice production using double log regression model.

**Keywords**—Agriculture, Paddy Cultivation, Adoption, Sustainable farming Practices, Paddy cultivation.

## I. INTRODUCTION

Kanyakumari District is a land of varied topography and the mountains of the Western Ghats bordering the northern side and with sea on three sides. The district comprises of four land classifications namely the Kurunchi, Mullai, Marutham and Neidhal.s. The district has a unique advantage of rainfall during both the south west and north east monsoons. Paddy cultivation is main source of agricultural activities in Kanyakumari District. Paddy is the major food crop in kanniyakumari district. It is grown in two seasons. April – June (Kannipoo) and September – October (Kumpapoo). The Agricultural Department plays vital role in improving the life of farmers. The method for accomplishing this incorporates low input techniques and skilled administration, which try to optimize the management and use of internal production inputs (i.e., on-farm resources). The levels of sustainable crop yields livestock production

which result in economically profitable returns. This enhances cultural and management practices such as crop rotation, recycling of animal manures and nutrient losses and conservation tillage to control soil erosion and to maintain or enhance soil productivity.

## II. REVIEW OF LITERATURE

Paddy is an important staple food crop for more than 60 percent of the world population. In 2008, more than 430 million metric tonnes of paddy were consumed worldwide, according to the USDA. India is an important centre of paddy cultivation. The paddy is cultivated on the largest areas in India. The Gross Cropped Area in Tamil Nadu is around 58.43 lakh hectares of which the Gross Irrigated Area is 33.09 lakh hectares which is 57% and the balance 43% of the area are under rainfed cultivation. Major efforts are required to increase the productivity of rainfed crops by overcoming the various challenges such as; erratic monsoon rains, soil with low nutrient and organic contents / poor water holding capacity, soil and water erosion, etc. Tamil Nadu one of the leading paddy growing states in India, has been cultivating paddy from time immemorial as this State is endowed with all favourable climatic conditions suitable for paddy growing.

## III.METHODOLOGY

The present study illustrates over paddy cultivation in Kanyakumari district of Tamil Nadu. A stratified random sampling design was used to calculate the paddy cultivation. Two categories of farms are taken to analyze the yield of rice production. The farms are defined as under; Small farms 0.00 acres 5.00 acres: Large farms 5.01 acres and above 5.00acres:

From the sub-divided list of farmers were selected from each district for preparing a sample of 110 farmers. Data was collected for the explanatory and explained variables with the help of stratified random sampling method through personal interviews of the farmers selected. Among the sample respondents 60 farmers came under the category of small farm size and 50 farmers came under the category of large farm size. Several random variables used in mathematical relationship Multiple linear regression (MLR) is used. In other terms, MLR determines how multiple independent variables are related with one dependent variable. The double log linear regression model of Cobb-Douglas type is adopted to estimate the important factors determining the yields for two farm size small and large farmers.

In this regression model, yield is considered on the dependent variable and input factors namely,

- human labour per acre in Rs.
- seeds in Rs.
- organic manure in Rs.
- fertilizer per acre in Rs.,
- pesticides per acre in Rs.,
- interest on working capital pre acre in Rs. are included as independent variable.

The following equation of multiple linear regression models is used for the study of determinants yield.

$$\text{Log } Y = \beta_0 + \beta_1 \log X_1 + \beta_2 \log X_2 + \beta_3 \log X_3 + \beta_4 \log X_4 + \beta_5 \log X_5 + \beta_6 \log X_6 + U$$

Where, Y = Yield per acre in Rs.

X1 = Human Labour per acre in Rs.

X2 = Seeds per acre in Rs.

X3 = Organic Manure per acre in Rs.

X4 = Fertilizer per acre in Rs.,

X5 = Pesticides per acre in Rs.,

X6 = Interest on Working Capital per acre in Rs.,

U = disturbance term with  $n(0, \sigma^2)$  The above equation model is estimated by the principle of least squares method.

#### Constraints Analysis

In order to find out the major yield constraints to attain potential yield at farm level, Garrett's ranking technique is used for this analysis. The sample farmers are requested to analyse the major constraints confronted by them in realising

the potential yield at farm as per priority. The rank assigned to each constraint by the sample farmers was converted into per cent position by using the formula.

$$\text{Per cent Position} = \frac{100(R_{ij} - 0.5)}{N_j}$$

Where,

R<sub>ij</sub> = Rank given by the jth farmers the ith variable.

N<sub>j</sub> = Number of variables ranked by the jth farmers.

#### IV.CONCLUSION

The present paper analysis has been classified in two parts that is production function and constraint faced by the farmers in Kanniyakumari District. This analysis reveals the inappropriateness of the production functions for the analysis of input variables use behavior of cultivators. The irrationality of inputs use behavior of cultivators may be influenced by the factors such as complementarity of input use, risk-preferences of cultivators, expectations regarding profits, asset position of cultivators, availability of information, availability of finance etc. Hence, by providing financial assistance and establishing agricultural information centres for proper utilization of input variables by farmers may increase the paddy production.

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