

STUDY AND ESTIMATION OF GROWTH RATE IN PADDY CULTIVATION

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Abstract— Paddy is the significant food crop in India. India is one of the world's biggest makers of white rice and earthy colored rice, representing 20% of all world rice creation. India traded significant amount of both Basmati as well as Non basmati rice to the world, and import in similar classes. The advanced technologies should be used in the agriculture sector to make more gains in agricultural activities. In this paper, estimate the growth rate in paddy cultivation. Tamil Nadu is right at the top among all the states with a staggeringly high number in terms of per hectare production.

Keywords—*Agriculture, Paddy Cultivation, System of Rice Intensification*

I.INTRODUCTION

The study focuses on the vertical and horizontal movement of area, creation and efficiency of paddy crop in the chose areas. The vertical development is the growth and the horizontal development is instability. In view of the consequences of development and instability, the chose zones and locale are delegated safe zone, respectably safe zone and inadequately safe zone. This study was done with following targets and development of region, production and productivity of Paddy crop. To measure the degree of variety in region, production and productivity of Paddy crop. To classify the different agro climatic zone based on the development and instability.

Production is a process, where by certain goods and services called inputs and changed into other goods and services called outputs. Different types of activities are involved in the production including changes in farms, location and the time of use of products. Each changes involves the use of inputs to produce the desired outputs. The farms outputs of products depend upon the quantities of inputs used in production. A production function provides

information concerning the quantity of output that may be expected when particular inputs are combined in a specific manner. The chemical, physical and biological properties determine the kind and amount of output which will be received from particular combination of inputs.

Depends on soil and bio-Climate conditions in India, the magnitude and intensity of crops grown in the region. The status of Socio-economic farmers and opportunities for marketing the surplus. Climatic zone of one period to another will affect the Vegetative and reproductive period leading to differences in potential yield. In Productivity factors affecting are seeding time and method dogy, crop establishment and climatic conditions during the growing season. To maximize the production and profits farmers generally take more than crop in a year. Agriculture in India has gradual transformation from subsistence farming of early fifties to the present intensive agriculture especially in better-endowed regions.

II.REVIEW OF LITERATURE

The paddy cultivation in India was 116. 42 million tonnes, covering an area of 43.79 million hectares, which was approximately 35.33 per cent of area under food crops and 40.86 per cent production of total food-grains of the country during 2018-19. It is an important staple food consumed by 65 per cent population of the country. It contributes around 10 per cent of the agricultural GDP and its production generates 3.5 billionmandays of employment(Ahmad, et al. 2017, Kumar et al., 2018). Consumption of rice as a staple food by a large proportion of people, its contribution in agricultural GDP and generation of employment highlights its role in national food security, income and employment generation in India (Ahmad et al.2019). Rice is the main staple food of India and is cultivated almost in all the states. The major rice producing states with respect to its share in

total rice production of the nation were West Bengal (13.79%), Uttar Pradesh (13.34%), Andhra Pradesh including Telangana (12.84%), Punjab (11.01%), Odisha(6.28%), Chhattisgarh (5.61%), Tamil Nadu (5.54%), Bihar (5.19%), Assam (4.41%), Haryana (3.88%) and Madhya Pradesh (3.86%). Keeping these facts in consideration, the present study was attempted to investigate growth and instability in area, production, productivity, cost of cultivation and profitability of rice in major rice producing states and nation as whole.

III. MATERIALS AND METHODS

. Based on the introduction of System of Rice Intensification (SRI) the major crop cultivation the entire period was sub divided into two sub periods

Estimation of growth rate

An exponential function of the form

$$Y = A B^t \quad (1)$$

$$\text{Log } Y = \log A + t \log B \quad (2)$$

Where, Y = Area / Production / Productivity

A = Constant

B = Regression Coefficient,

and t = Time (in years) Compound growth rate (CGR) = (Antilog of B - 1) x 100

The compound growth rates (CGRs) of area, production and productivity of rice in major rice producing states of India was computed both for states and for India as a whole, using the following formula:

$$CGR = (\text{Anti log of } b - 1) 100 \quad (3)$$

Where, b is the regression coefficient. Instability is the deviation from trend and many of the researchers have used the coefficient of variation (CV) as a tool of instability. An index of instability was computed for examining the nature and degree of instability in area, production and yield of the rice crop at state and nation level. Simple CV does not explain properly the trend component inherent in the time series data so the instability index was calculated using better measure of variability suggested by CuddyDella Valle index (Cuddy and Della, 1978).

$$\text{Instability Index} = CV * \sqrt{1 - R^2} \quad (4)$$

CV = Standard deviation of the variable Mean of the variable X100

If the estimated coefficient of regression equation is not significant, then the CV itself is taken as instability index. Where, CV is coefficient of variation and R² is the

coefficient of determination from a time series trend regression adjusted by the number of degrees of freedom.

IV. CONCLUSION

Growth rates of production and productivity in paddy cultivation was positive and significant indicating the production of rice has increased during the period under study. Compound growth rate of area under rice was almost constant in the country during the period of investigation and it was fluctuating. Due to technological changes in cultivation practices, instability found to be less as compared to production and productivity. Increased instability in production also indicated distress in rice production across the states.

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