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# A STUDY ON TRANSPOSE OF CROPPING PATTERN AND SINGIFICANT INFLUENCE ON AGRICULTURAL PRODUCTIVITY IN TAMILNADU

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***Abstract:*** **India is a largest country possesses considerable agricultural development. Several areas exhibit various features hence that none of the plan can be conceived for all agricultural divisions around the country. The national income of agriculture is often taken as a barometer of economic development. Agricultural sector in India has marked an admirable performance over the last decades by improving the global market position. With a 52 of 18 percent between 1969-2021, contribution to GDP decreases and the sector provides 55.47 percent of employment opportunities. On the whole GDP growth towards agricultural sector was 6.9% at the national level. Since, several studies on Tamil Nadu concentrated on areas like cropping pattern related to productivity. Thus, the study attempts to reach the shifting pattern of cropping pattern and significant influence on Agricultural Productivity in Tamil Nadu. The study has taken up for five years from 2016-2017 and 2020--2021 and the select crops are restricted with principal crops only. The selected crops are Cotton, Sugarcane, Tea, Coffee and Coconut. Thus, the study concluded that the price of Tea, Sugarcane, Coffee and Cotton has a greater significant impact on Agricultural productivity. Hence, the study suggests that TNAS has to improve agricultural productivity by making intensive integrated farming system, soil health improvement through bio fertilizer and Green Manuring which induce the residual growth in Agricultural production during the study period.**

***Key Words:*** **Agricultural Productivity, Cropping Pattern, National Income, Gross Domestic Product, Global Market Position.**

## I. INTRODUCTION

India is a largest country possesses considerable agricultural development. Several areas exhibit various features hence that none of the plan can be conceived for all agricultural divisions around the country. The national income of agriculture is often taken as a barometer of economic development. Agricultural sector in India has marked an admirable performance over the last decades by improving the global market position. With a 52 percent of 18 percent between 1969-2021 contribution to GDP decreases and the sector provides 55.47 percent of employment opportunities. On the whole GDP growth towards agricultural sector was 6.9% at the national level. Far from other region in India, Tamil Nadu is signalized by extreme poverty diversion and agro climate endowments. The contribution towards agriculture productivity has declining as the other sector marked higher rates of growth.

**Research Issue**

Marginalization of agricultural holdings due to extreme division and segmentation are in the decreasing trend in farm operation which resultant in fall of agricultural production and overall costs. Agricultural development experience worsen in the state of Tamil Nadu for last 70 years however it has been segregated by sharp decline in the area under principle crops mainly Cotton, Sugarcane, Tea, Coffee and Coconut are the substantial expansion in the area under commercial agricultural domination by plantation crops, planting higher labor intensive, cultivation, increasing wage rate import and export price, promotional activities by the government which have dramatically encouraged by the cultivator in Tamil Nadu. Thus, cropping pattern has a significant influence of agricultural production. Hence the present study aims to concentrate on shift in transpose of cropping pattern and influence of agricultural productivity in Tamil Nadu.

## II. REVIEW OF LITERATURE

**Muhammed Fisaq (2020)** examined the distributional effects of technical change in Philippines' agriculture using

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a general equilibrium model. They show that technical change in Philippine agriculture raised incomes, reduced poverty and improved the income distribution. Further, they argue that income distributional aspects of technical change depend on differential changes in returns to primary factors of production, the distribution of returns between factors of production that are mobile across industries and the relationship between changes in the prices of final consumer goods and expenditure patterns of different income classes.

**S K Sun and David (2020)** used the same model to trace the effects of differential rates of technical progress in the irrigated and non-irrigated agricultural sectors on income distribution of factor owning household groups, poverty and economic welfare within a small open economy with open agricultural trade and agricultural trade under restrictions. The results clearly showed that reduced poverty from technical progress is substantially greater when agricultural trade is unrestricted at a constant world price.

**Y B Wang (2020)** analyses the temporal evolution of cropping pattern from 2008 to 2018 in the Hetao Irrigation District (HID), China. The impact of changing cropping patterns on regional agricultural water productivity is evaluated from the water footprint (WF) perspective. Results show that the area under cash crops (e.g. sunflower and melon) has risen phenomenally over the study period because of increased economic returns pursued by farmers. Most of these cash crops have a smaller WF (high water productivity) than grain crops in HID. With the increase of area sown to cash crops, water productivity in HID increased substantially. The results of this case study indicate that regional agricultural water can be used effectively by properly planning crop areas and patterns under irrigation water limitations. However, there is a need to foster a cropping pattern that is multifunctional and sustainable, which can guarantee food security, enhance natural resource use and provide stable and high returns to farmers.

**Objectives Of The Study**

To examine the impact of cropping pattern of select principle crop on agricultural productivity in the Tamil Nadu.

**Research Methodology**

The study is purely based on secondary data. The data is collected for a period of five years spanning from 2016-2017 to 2020-2021 by using Multiple Regression analysis. The principle crops are Cotton, Sugarcane, Tea, Coffee and Coconut for cropping pattern. Pair wise granger causality is applies for estimating the association between the principle crops cropping pattern and agricultural productivity. The data has collected from the various TNAU Agritech portal and World bank big data analysis.

## III. ANALYSIS AND INTERPRETATION

**MULTIPLE REGRESSION ANALYSIS OF SELECT PRINCIPLE CROPS ON AGRICULTURAL PRODUCTIVITY FOR THE PERIOD OF 2016-2017 TO 2020-2021.**

**$H_0$:** There is no significant impact of select principle crops on agricultural productivity in Tamil Nadu. **TABLE 1**

| Principle Crops | R | R Square | Std. Error | Durbin Watson | F | Sig |
|---|---|---|---|---|---|---|
| **Cotton** | .925[a] | .855 | 125.55 | 1.09 | 6.514 | **.000[b]** |
| **Sugar** | .872[a] | .760 | 424.11 | 2.84 | 31.56 | **.000[b]** |
| **Tea** | .919[a] | .844 | 102.46 | 1.46 | 48.39 | **.000[b]** |
| **Coffee** | .816[a] | .665 | 158.56 | 2.47 | 31.99 | **.000[b]** |
| **Coconut** | .991[a] | .982 | 140.17 | 1.52 | 64.01 | **0.00[b]** |

**5% Level of Significance**

**Independent Variable: Cotton, Sugar, Tea, Coffee and Coconut**

**Dependent Variable: Agricultural Production**

Table 1 describes the Impact of Agricultural production on select principle crops in Tamil Nadu. It is represents from the table that the R square value for principle crops is 0.952, 0.827, 0.919, 0.816 and 0.991 which indicates that 95, 82, 91, 81, 99 percent variation in value of agricultural production are explained by the select principle crops. Since the p value of f statistics is lesser than significant value 0.05 for all the select principle crops then it is concluded null hypotheses is rejected and declared as that there is a significant impact of agricultural productivity on select principle crops.

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**Pair Wise Granger Causality Test Result Of Select Principle Crops And Agricultural Productivity**

**Table 2 shows the pair wise granger causality test result**

| **Pair wise Hypotheses** | **F-statistic** | **Prob.** | **Decision** | **Type of Causality** |
|---|---|---|---|---|
| COTTON does not granger cause AGRI PRODU | 0.8452 | 0.554 | DNR $H_0$ | No Causality |
| AGRI PRODU does not granger cause COTTON | 1.225 | 0.201 | DNR $H_0$ | |
| SUGAR does not granger cause AGRI PRODU | 3.147 | 0.189 | DNR $H_0$ | Uni-Directional Causality |
| AGRI PRODU does not granger cause SUGAR | 0.904 | 0.047 | Reject $H_0$ | |
| TEA does not granger cause AGRI PRODU | 0.114 | 0.012 | Reject $H_0$ | Uni-Directional Causality |
| AGRI PRODU does not granger cause TEA | 2.569 | 0.185 | DNR $H_0$ | |
| COFFEE does not granger cause AGRI PRODU | 4.485 | 1.254 | DNR $H_0$ | Uni-Directional Causality |
| AGRI PRODU does not granger cause COFFEE | 0.884 | 0.002 | Reject $H_0$ | |
| COCONUT does not granger cause AGRI PRODU | 1.047 | 0.114 | DNR $H_0$ | No Causality |
| AGRI PRODU does not granger cause COCONUT | 2.597 | 0.470 | DNR $H_0$ | |

**Source: Complied and Computed from World Bank**
**Note: DNR $H_0$- Do not Reject**

Table 2 expresses the result of granger causality test of select principle crops and agricultural productivity. It interprets that there is no causality exists between Agricultural production with cotton and coconut, whereas remaining indicators such as Sugar, Tea and Coffee has a Uni Directional Causality between Agricultural productions.

## IV. SUGGESTIONS OF THE STUDY

1. All the select principle crops have a significant impact on agricultural productivity. So the Tamil Nadu agriculture has to improve agricultural productivity by making intensive integrated farming system, soil health improvement through bio fertilizer and Green Manuring.
2. For doubling agricultural productivity the government has to provide incentive structure in the form of remunerative prices for Coffee, Coconut, Tea and sugar. Hence it helps in increasing cropping intensity by saving the cost of production.

## V. CONCLUSION OF THE STUDY

Magnification in agriculture and its productivity are considered as a crucial part by accomplishing the substantial poverty reduction in Tamil Nadu. It is vitally important that the agricultural output has to increase at a stipulated rate to meet the growing demand for principle crops such as coffee, coconut, sugar, tea and cotton. Thus the study concluded that technology cut down the inputs, decreasing production costs which inevitably increases the profits, output and employment will increase, but profits are not increase. Instead of, if the technology increases labor productivity, expenses of output and profit will also increases and vice versa. This may likely to reduce the lower yield by increasing more production.

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