AN ECONOMETRIC ANALYSIS OF COARSE CEREALS IN TAMIL NADU

R. MUTHU MEENAL

Ph.D, Research Scholar, Department of Economics,
Sri Sarada College for Women (Autonomous), Salem – 636 016, India.

INTRODUCTION

Agriculture is the main stay of Indian economy. As much as 75% of the population is engaged in agriculture that provides employment to almost two third of the working force. Though the share of contribution of agriculture to domestic product has been reduced over the period, still agriculture plays significant role in the form of producing food for the people of the country and other agricultural commodities to support industry and service sector. Agriculture is characterized by small holdings, low capitalization and low yield per unit of land. In agriculture sector, food crop plays predominant role, which includes cereals, coarse cereals, and pulses etc. Cereals are major dietary energy supplier all over the world. Under this a significant change in cropping pattern and shift in cultivation leads to variation in area, production and yield factors of coarse cereals production are witnessed. India is the largest producer of many kinds of coarse cereals. However, realizing the nutrient richness of coarse cereals they are now considered as "Nutria cereals".

Coarse cereals, as a group includes several grain crops namely cholam, cumbu, ragi, maize, varagu, samai and panivaragu. Though they occupy relatively a lower position among food crops in agriculture sector, they are quite important from the point of food security at regional and farm level. They further contribute to the widening of food basket, which at present is narrow because of excessive dependence on a fewer food crops like rice and wheat. The coarse cereals are well known as their superior quality, nutritional security and human health. When one looks at the traditional and earlier food habits in the country, it would be realized that one or the other small millets dominated in the past in almost every region.

STATE PERFORMANCE OF COARSE CEREALS

In 2014-15 coarse cereals have been cultivated in an area of 926 thousand hectares, producing about 4079 thousand tonnes with the yield of 4401 kg/hectare in Tamil Nadu. In view of these facts, Tamil Nadu appears to be one of the major coarse cereals producing states in India. Currently there are 32 districts in Tamil Nadu state. Except Chennai, remaining 31 districts were divided in to seven zones like Western zone, Southern zone, North western zone, North eastern zone, Delta zone, Highly rainfall zone and Hilly zone based on agro climatic conditions of Tamil Nadu. Hence, there is absence of coarse cereals in the last two zones and were not taken into account for the present study. The study pertains to five zones of Tamil Nadu and the state as a whole during the post reform period which was 1990-91 to 2014-15.

OBJECTIVES OF THE STUDY

- To examine the performance of coarse cereals in Tamil Nadu during the period 1990-91 to 2014-15.
- To examine the sources of output growth of coarse cereals of Tamil Nadu using the Decomposition analysis during the study period.
- To suggest the possible solutions to increase the cultivating area and yield rate.

MATERIAL AND METHODS

In the present study has based on purely time series secondary data covering the period from 1990-91 to 2014-15 for the total coarse cereals in Tamil Nadu. Major coarse cereals producing zones were selected for the purpose of study. The data on area, production and productivity of total coarse cereals were the collected from Department of Economics and Statistics of Tamil Nadu. In recent years many attempts have been made to identify the contribution of each factor to the growth of coarse cereals production. To measure the relative contribution of area, yield to the total output change for the coarse cereals, Minhas (1964), the decomposition analysis model as given below was used. Sharma (1977) redeveloped the model and several research workers (Kalamkar et al., 2002) used this model and studied growth

performance of crop on state. The method states that the total change in production is attributed due to area and yield that can be decomposed into three components viz., yield effect, area effect and the interaction effect and A_0, P_0 and Y_0 are values of the respective variable in n^{th} year then.

$P_0 = A_0 \times Y_0$ and

$P_{n} = A_n \times Y_n$ (1)

Where, A_0 and A_n represent the area

Y_0 and Y_n represent the yield

P_0 and P_n represent the production in the base year and n^{th} year respectively.

$P_n - P_0 = \Delta P$

$A_n - A_0 = \Delta A$

$Y_n - Y_0 = \Delta Y$ (2)

From equation (1) and (2) we can write

$P_0 + \Delta P = (A_0 + \Delta A)(Y_n + \Delta Y)$

Hence,

$P = A_0 \Delta Y / \Delta Y \times 100 + Y_0 \Delta A / \Delta P \times 100 + \Delta Y \Delta A / \Delta P \times 100$

Change in Production = Yield effect + area effect + interaction effect

This study is only restricted to the coarse cereals production of selected five zones of Tamil Nadu and state as a whole. Total coarse cereals account for only 24 percentage of total cropped area in Tamil Nadu state. With the help of decomposition, the percentage contribution of area, yield and interaction effect on production of coarse cereals in Tamil Nadu state has been analysed and presented.

RESULT AND DISCUSSION

The effect of yield, area and their interaction to the production of total coarse cereals during post reform period from 1990-91 to 2014-15 in selected zones of Tamil Nadu and state as a whole has explained by the following table.

Table-1: Zone Wise Per Cent Contribution of Area, Yield and Their Interaction
of Differential Production of Total Coarse Cereals in Tamil Nadu during Post Reform Period

(In percentage)

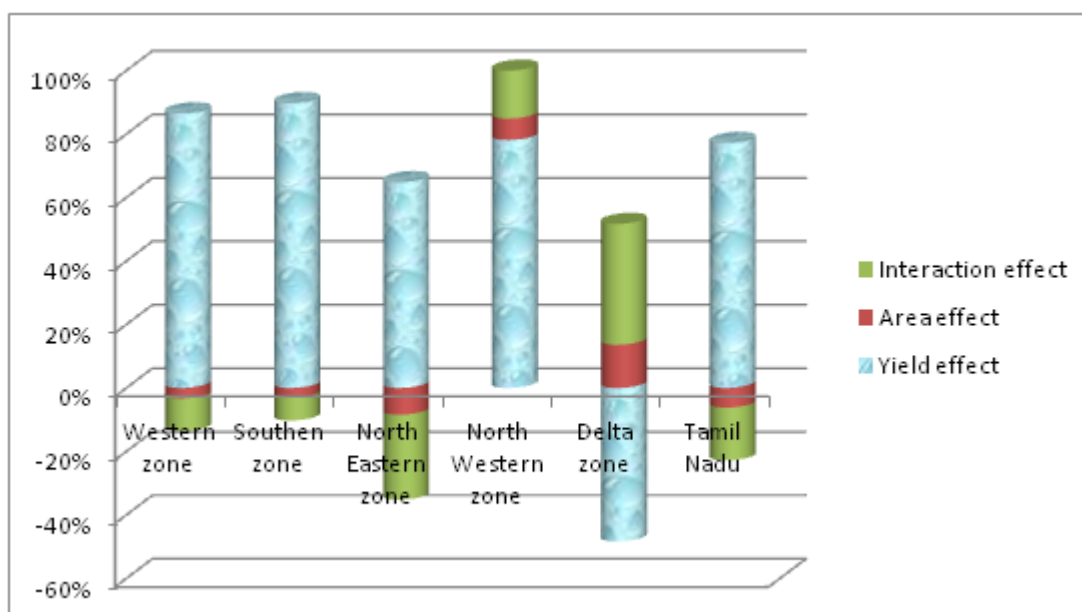| Zone	Components			
	Yield Effect	Area Effect	Interaction Effect	Change in Production
Western Zone	118.47	-4.45	-14.02	100
Southern Zone	112.90	-3.86	-9.04	100
North Eastern Zone	218.36	-28.32	-90.04	100
North Western Zone	78.14	6.76	15.1	100
Delta Zone	-1415.77	398.94	1116.83	100
Tamil Nadu	141.90	-11.3	-30.60	100

Source: Compiled by the Researcher

Figure-1: Zone Wise Per Cent Contribution of Area, Yield and their Interaction of Differential Production of Total Coarse Cereals in Tamil Nadu during Post Reform Period

The result of change in production of coarse cereals has been grouped into increasing percentage in yield effect except delta zone, which explains that yield factors plays major role than area allocation and their interaction factors in the production of total coarse cereals in western zone, southern zone, north eastern zone, north western zone of Tamil Nadu and state as a whole. This situation is contrary in delta zone which shows interaction effect is higher than area effect followed by negative yield effect. The contribution of yield factors has a major role in increasing production of total coarse cereals which offset the other two effects in western zone, southern zone, north eastern zone and Tamil Nadu state as a whole. In north western zone, yield growth rate of coarse cereals were recorded that all the three effects were positive with 78.14 per cent yield effect, 6.76 per cent area effect and 15 per cent interaction effect during the study period in Tamil Nadu.

FUTURE STRATEGY

The main plank of the future strategy for the development of coarse cereals in the study area shall comprise of measures for improving production through productivity enhancement and utilization of surplus land. Improving productivity through the use of technology reducing cost of production by efficient utilization of resources, improving quality of products by adoption of good post-harvest management and processing, promoting marketing and export, developing market coupled with price stabilization, reducing the risk through insurance, strengthening the institutional support system to address the needs for human resources development and addressing relevant policy issues. These thrust areas have to be achieved through production and productivity enhancement along with policy initiatives. To cope with the ever increasing demand for variety of coarse cereals, some modern trends and latest strategies have been evolved and taken by the scientists, policy makers and farmers. The pressure on land is considerably increasing. Therefore, wasteland utilization program may be started vigorously everywhere. Wasteland Boards may be set up so that such pieces of land may be treated and identified for their best use as they are lying uncultivated and barren.

The discussion thus reveals that the growth in production of coarse cereals was mainly on account of growth of yield. More than 90 per cent area under coarse cereals is dependent on seasonal rainfall, the regularity of which determines the level of harvest in a year. To increase the output of coarse cereals, it is necessary to raise their productivity by evolving high yielding varieties with stable crop yield as per different agro climatic conditions. This may be followed by appropriate extension education programmes to the farmers to acquaint them with better and efficient methods of crop husbandry.

Transfer of technology is not adequate in rain fed crops and secondly financial assistance for the rain fed growers is a must and simultaneously price received by the farmers has to increase. One of the major reasons for the increase in total production in coarse cereals is the profitability of that crop due to higher nutrition comparing to all other cereals.

It may be concluded that future efforts need to be directed towards expansion in acreage and the direction lays tremendous potential for increasing cereals production in the state. Small and marginal farmers show preference towards these crops. The resource requirement for these crops is also low and need minimum cash component in their total cost of cultivation. These crops provide nutrients at lowest cost compared to rice and wheat. It forms an important component of livestock feed and also a potential source of income to the poor farmers.

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