Abstract

The agriculture is an important subsector of the primary sector in Kerala. It is the backbone of the every economy. Without the development of the agriculture, an economy cannot sustain. But its contribution has been declining. Its contribution to the state domestic product was 17.11 percent in 2005-06 but it declined to 9.34 percent in 2012-13. In order to find out this deceleration compound growth rate was calculated. For the analysis, secondary data of various important crops from 2000-2015 in Kerala was utilised. The result of the analysis showed the in rainfall deficiency. The actual rainfall received in Kerala was less than the normal. Rainfall deficiency was noticed. Therefore better and modern irrigation facilities and application of developed farming system will improve the area as well as production of agricultural crops.

I. INRODUCION

Kerala lies along the coastline, to the extreme south west of the Indian peninsula, flanked by the Arabian Sea on the west and the mountains of the Western Ghats on the east. This land of Parasurama stretches north-south along a coastline of 580 kms with a varying width of 35 to 120 kms. Cascading delicately down the hills to the coasts covered by verdant coconut groves, the topography and physical characteristics change distinctly from east to west. The nature of the terrain and its physical features, divides an east west cross section of the state into three distinct regions-hills and valleys, midland and plains and the coastal region. Located between north latitudes 8018’ and 12048’ and east longitudes 74052’ and 72022’, this land of eternal beauty encompasses 1.18 per cent of
the country (agricultural credit plan 2016). In the state, out of 38, 86,287 ha of total geographical area 26, 47,461 ha of land (53.49%) is cultivated with various crops during 2010-11(District Agricultural Credit Plan 2016). With this diverse topography of the state its primary contribution to the state domestic product was 17.11 percent in 2005-06 but it declined to 9.34 percent in 2012-13(Directorate of Fisheries, Govt of Kerala, 15).The agricultural scenarios also changes with the change in landforms. Low land in the low lying coastal belt in the west, where rice and coconut are the important crops cultivated. The high land consists of the Western Ghats mountain range forming the eastern part of the state cultivates major crops include rubber, spices, coffee, and tea. The midland, a varied terrain of small valleys and hills has a wide variety of crops like rice, tapioca, cocoa, clove, nutmeg, ginger, pepper, areca nut, cashew, coconut, rubber etc.

II. IMPORTANCE OF THE STUDY

Kerala, the god’s own country is famous for the production and exports of commercial crops such as coconut, spices, ginger etc. But its production and productivity tend to be decreased because of the variability in climate. The common trend we could saw was the change in land use pattern. Land is put for the use of construction of buildings and resorts. This is because of the unstable political set up and unfavourable climate. In this context, the study wants to analyse the trend of important crops in Kerala. Agriculture is included in the primary sector of the economy. In Kerala service sector contributed more to the state domestic product. The main intention of the study is to understand the agricultural scenario of Kerala at present and suggests the remedial measures. Agricultural development is essential for the development of the economy because it has both forward and backward linkages.

III. REVIEW OF LITERATURE

Kaiser et al. (1994) found that the farm-level impacts of climate change on net revenue generally were more detrimental in southern states (Georgia and North Carolina) than in northern states (Minnesota, Nebraska, Illinois, Iowa, and Ohio). A key conclusion of the 1993 study by Kaiser et al. is that economic impact studies of climate change must model the role of adjustments by agriculture over time; otherwise the negative impacts will be overstated.

Climate change would increase the disparities in cereal production between developed and developing countries. Production in the developed world may well benefit from the anticipated climate change; whereas production in developing nations may decline. This is largely a function of geographical location. The study concluded that adaptation at the farm level will do little to reduce this disparity, with the developing world less able to take advantage of adaptive opportunities. It is therefore, stated that cereal prices are likely to rise and thereby the population at risk of hunger will increase (Rosenzweig and Parry, 1994)
IV. OBJECTIVES

[1] To examine the land use pattern in Kerala

[2] To analyse the trend of compound growth rates of important crops in Kerala

V. METHODOLOGY

To analyse the rate of growth of important crops in Kerala compound growth rate was calculated. The study period was from 2000-2015. The entire period was divided into three phases. Phase I (2000-2005), Phase II (2005-2010) and phase III (2010-2015). For the analysis secondary data was used. Data collected from various issues of agricultural statistics and economic statistics published by govt. of Kerala.

V. ANALYSIS OF THE STUDY

Kerala is one of those States in India where land resources are put to more intensive use than anywhere else, mainly because of the low per capita availability of land in the State. Data on land use pattern and number of operational holdings for the year 2014-15 is given in the graph 1.
The graph 1 shows the land use pattern of Kerala during 2014-15. Among the total land on earth, net area sown is 53 per cent. Forest covers 28 per cent, land put to non agricultural purpose were 11 per cent. Current non agricultural land was 11 per cent, fallow land other than current fallow was 1 per cent, and cultivatable waste was 3 per cent and barren, uncultivatable land was 0.35 per cent.

Under this analysis the trend analysis of area, production and productivity was calculated for the period from 2000 to 2015. The result of the analysis was given in section 2.1.

Area and production trend of rice showed negative trend during this period but the productivity showed positive growth. Tapioca and coconut accounted negative trend in area under cultivation whereas the production and productivity recorded positive trend. All the three variables such as area, production and productivity of banana and areca nut indicated positive trend which means that banana cultivation increased in every year. Whereas rubber cultivation revealed a positive trend in area and production but productivity showed negative trend. Cashew disclosed a different scenario that the area, production and productivity showed negative trend. In the case of pepper, its productivity showed positive trend whereas area and production registered negative trend. Mango gave a picture of positive production and productivity trend whereas area trend displayed negative trend

5.1. Rate of Growth of Important Crops in Kerala

To find out the increasing and decreasing trend in area production and productivity of important crops in Kerala the crop wise compound growth analysis has been carried out. Under this analysis, the year from 2000 to 2015 were split into three phases i.e. Phase I: 2000-2005 and phase II: 2005-2010 phase III -2010-2015

a) Rice

Compound growth rates in area and production of rice were negative even if the whole analysis (2000-15) split into three sub periods. The decline came down during the last two sub periods (2005-10 and later) Reduction in area under cultivation is mainly because of crop shifting (UNFCCC 2009, Kannan et. al., 1999). Continuous crop failure leads the farmers shift paddy to banana and other crops. Productivity is an exception as it showed positive trend (0.30 to 2.34 per cent) during the years under consideration. The picture is much clear when we look in to variation analysis done for data pertaining to 2000 and 2015. The analysis reveals that both the area and production change were unfavourable and the productivity change was favourable for paddy cultivation in Kerala.

b) Tapioca

Tapioca gave an entirely different picture. It shows an increase in all the three variables while travelling from first phase to third phase. The patterns noted are as below. The area growth rate was negative (-6.594 & -3.06 per cent) during 2000-2005 and 2005-10 but it was positive (8.90 per cent) between 2010-11 and 2014-15. The production growth rate was increased (-1.15 to 2.31 per cent) when compared to 2000-05 and 2014-15. In the case of productivity growth a sudden increase was noticed. Productivity increased from 5.82...
percent during 2000-01 and 2005-06 to 13.27 percent in 2010-2015. Variation analysis also shows the positive increase in all variables such as area, production and productivity.

c) Banana
The trends in banana give us a ray of hope while looking the performance of area, production and productivity of banana for 2005-10 and 2010-2015. An increasing trend was noticed for all the variables. The area (-2.62 to 3.98 per cent), production (-3.01 to 6.29 per cent), and productivity (-0.30 to 2.18 per cent) increased in 2010-2015 compared to 2005-10 period. Therefore the performance of banana cultivation in Kerala was better than in first phase compared to other two phases. The variation analysis also showed increase in area, production and productivity of banana. This is mainly because of farmer shift from rice cultivation to banana. In 1985-86 the area under banana crop was 16500 ha and in 2004-05 the area under banana crop area has increased to 59000 ha which accounts 257 percent increase (Department of Economic and Statistics 2006).

d) Coconut
Kerala has the name “land of coconuts” as well known for the large scale production of coconuts. The performance of coconut can be categorised as positive in area and production even though not a drastic increase as in the case of banana, the production growth rate shows a small increase to (-0.96 from 0.92 per cent). But, the productivity presents a gloomy picture as growth rate showed a drastic decline (25.18 to 0.44 per cent). While travelling from first to third phases, the first phase production performance was so better than the other two phases.

e) Rubber
Rubber once considered as back bone commercial crop of Kerala is now showing a declining trend in area, production and productivity. In the second phase, area growth (1.97 per cent) was better than first and third (0.33 and 0.93 per cent). The production growth rate declined (2.53 to -6.69 per cent) and the productivity growth rate declined (0.91 to -7.56 per cent) during 2005-2015 compared to the first phase. The variation analysis shows also justifies the findings of share analysis as it shows decline in production and productivity of rubber from 2000 to 2015.

f) Cashew
For cashew the area and production growth shows negative rate during three phases under consideration. The area growth rate was -0.81 percent during 2010-2015. A drastic decline was noticed in the second phase. The production and the productivity growth rate were -3.40 and -1.82 percent respectively during 2010-15. Productivity growth in cashew nut was positive during the first two phases but later turned negative. The variation analysis also showed the negative trend in area, production and productivity because of rainfall variability. Therefore the cashew production in Kerala was not so good in the recent past.

g) Areca nut
A mixed trend in area, production and productivity in areca nut is witnessed during the study period. The area growth of the crop was negative (-1.57 and -0.47 per cent), while
production and productivity growth were positive (3.00 and 3.48 per cent) for areca nut in Kerala in 2010-2015. But during the first phase, its position in area and production was good. Its productivity increased in recent past. The variation analysis reinforces the findings of share analysis.

**h) Pepper**

While analysing the pepper, negative growth trend was noticed for area under cultivation in Kerala during the last two phases. The production and productivity growth rate turned to negative during the second phase but again became positive in the last phase. A drastic notable increase was seen in the case of pepper productivity. The variation analysis also showed Pepper has good productivity in Kerala. The compound growth rate of area, production and productivity crops was shown in the table 1.

**Table 1: Area, Production and Productivity Compound Growth Rates of Crops in Kerala**

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<tbody>
<tr>
<td>Rice</td>
<td>-4.62901</td>
<td>-3.84255</td>
<td>-3.19558</td>
<td>-4.3847</td>
<td>-1.62426</td>
<td>-0.76702</td>
<td>0.295368</td>
<td>2.323184</td>
<td>2.33885</td>
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<tr>
<td>Coconut</td>
<td>-0.67821</td>
<td>-2.40586</td>
<td>0.442627</td>
<td>2.339563</td>
<td>-0.92391</td>
<td>0.96474</td>
<td>3.018069</td>
<td>5.18222</td>
<td>0.443238</td>
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<tr>
<td>Rubber</td>
<td>0.33485</td>
<td>1.972269</td>
<td>0.930652</td>
<td>4.825317</td>
<td>2.534292</td>
<td>-6.69466</td>
<td>4.474508</td>
<td>0.910429</td>
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<tr>
<td>Cashew</td>
<td>-2.77896</td>
<td>-9.59114</td>
<td>-0.80481</td>
<td>-1.78251</td>
<td>-5.2898</td>
<td>-3.39922</td>
<td>1.037974</td>
<td>5.329217</td>
<td>-1.82525</td>
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<tr>
<td>Areca nut</td>
<td>5.247812</td>
<td>-1.57061</td>
<td>-0.46784</td>
<td>6.965795</td>
<td>1.438881</td>
<td>3.001885</td>
<td>1.626911</td>
<td>3.074827</td>
<td>3.480616</td>
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Source: Computed on the basis of data from various issues of agricultural statistics

The whole analysis can be summarized in graph 2.2 which shows the growth of area, production and productivity of important crops in 2005-2010 and 2010-2015.

**Graph 2 : Comparative growth rates of area, production and productivity of important crops in Kerala**

Source: Own Computation
VI. FINDINGS AND CONCLUSION
From the above analysis it was found that the area under cultivation of rice, coconut, cashew, arecanut and pepper has decreased and the production of rice, cashew, rubber, arecanut has decreased whereas the productivity of rice, tapioca, banana, cashew, arecanut and pepper has increased considerably. This is mainly because of the unprofitable agricultural situation. Most of farmers are mainly depend on monsoon. But the actual rainfall received in Kerala was less than the normal. Rainfall deficiency was noticed. Therefore better and modern irrigation facilities and application of developed farming system will improve the area as well as production of agricultural crops.

VI. REFERENCES

PAPER CITATION
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