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Seasonal Rainfall Variability and Trend over Kerala

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Abstract: ***Inorder to understand the impact of climate change over Kerala such as 14 districts, a study have been extended over long term meteorological data such as rainfall. A Period of thirty three years beginning 1979 has been chosen. The method of linear trend model has been used for the study. From the result of study overall trend of annual rainfall decreasing through the period and monthly trend of South -West monsoon and winter rainfall recorded a negative phase in the trend. Similarly North-East monsoon and Pre-monsoon have been increasing and it is inferred that decreasing trend in South- West monsoon and increasing trend in North-East monsoon which indicate shift in rainfall pattern it is the after effect of climate change.***

I. INTRODUCTION

Climatic condition of earth has been changing over the past years. The climate change in weather has their effect influence on Kerala. Human activities are the main causes for climate change[5]. The variation analysis of rainfall data of kerala region reveals a negative trend of rainfall that is resulting into depletion of climate. The over exploitation due to many factors such as industrialisation, population growth, deforestation uses of chemicals, burnig of fuels, etc,. This causes more heat in our atmosphere which leads global warming and climate change[4]. Climate change is a very serious issue now-a- days.

II. DATA AND METHODOLOGY

The rainfall data of Kerala region for a period of 33 years covering 1979 to 2012 have been collected from Indian Meteorological Department Thiruvanathapuram, analysed by using statistical techniques of data analysis. The arithmetical procedure involves the determination of average rainfall for specific period. Here analysing the significance of annual, seasonal monthly rainfall trends. The method of least square fit of straight line has been used for performing the trend analysis of the behaviour of annual rainfall. The decreasing mean annual rainfall trend in the study area resembles the previous rainfall trend studies carried out in the countrry[2].

III. LOCATIONAL DESCRIPTION

The state Kerala contains 14 districts they are Thiruvanathapuram, Kollam, Pathanamthitta, Alappuzha, kottayam, Ernakulam, Thrissur, Idukki, Malappuram, Wayanad, palakkad, Kozhikode, Kasargode and kannur. For the thirty three year rainfall analysis fourteen district rainfall data have been chosen.

IV. RESULT AND DISCUSSION

A. The trend of Southwest Monsoon of Kerala

Table 1.1 Monthly total rainfall of southwest monsoon

Year	Rainfall (mm)
1983	Max: 4451.2
1990	Min:1606.1

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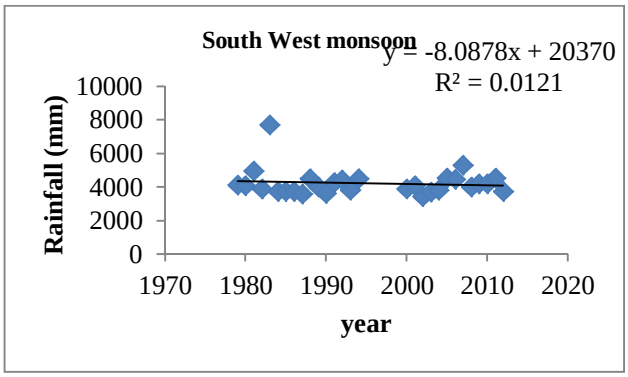

Fig. 1 The trend of South West monsoon

Table 1.2 Monthly total rainfall of southwest monsoon

Rainfall	June	July	August	September
Max(mm)	1123.7	3748.2	595.2	529.6
Min (mm)	331.6	238.2	251.8	45.8

The maximum and minimum rainfall of the Southwest monsoon given in table 1.2, it is a thirty three year average rainfall data starting the year 1979. Rainfall obtained in all the months of South West monsoon July recorded the maximum of 3748.2mm which is more than thrice of the rainfall obtained in monsoon setting month June. Also it is the maximum rainfall received over all the months of the year. Receding months of Southwest monsoon in August and September recorded very low value compared to the maximum rainfall experienced during initial two months. The average rainfall in Kerala during the South West monsoon period is 70%.

B. The Trend of North-east Monsoon at Kerala

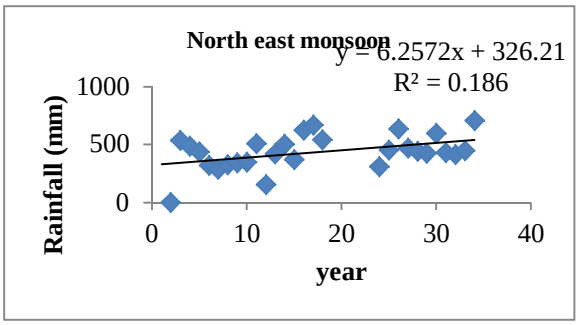

Fig 2 The trend of North East monsoon

Table 1.3Monthly rainfall of North East monsoon

Rainfall	October	November
Max (mm)	514.6	327.8
Min (mm)	82.3	72.5

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From the figure 2, the thirty three year study reveals that there is an increasing trend in North East monsoon. Average rainfall of North East monsoon is only 16% which is too below than that was contributed by South West monsoon (70%) for a long term. The study concluded that there is a significant long term decrease in South West monsoon seen, which is the major portion of rainfall season in Kerala region. However, there is an increasing trend seen during North East monsoon. The major difference is percentage rainfall between the both the season is 54%. Since the decrease in trend during South West monsoon cannot be compensated with the contribution of North East rainfall. The change of patterns in monsoon for the long term influences agriculture and bio diversity in the opposite manner. Net deficit of longterm annual rainfall depletes the ground water reservoir.

C. The trend of Pre- monsoon at Kerala

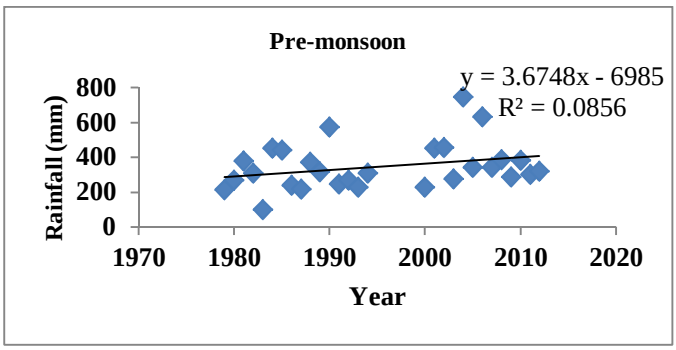

Fig. 3 The trend of Pre- monsoon

Table 1.4 Monthly rainfall of Pre- monsoon

Rainfall	March	April	May
Max (mm)	199.4	221.3	527.5
Min (mm)	0	31	692

The figure 3, reveals that there is an increasing trend in pre-monsoon rainfall. The maximum and minimum rainfall of the pre-monsoon is given in table 1.4, out of thirty three years data, the rainfall obtained the month May is maximum and it is more than the value obtained in the other two months of the Pre-monsoon. Comparing three months minimum rainfall of 0mm rainfall recorded the month March. Pre-monsoon months are very hot during the last two decades. Pre-monsoon months register 12% of total annual rainfall. Thus there is an increase in trend should be seen as advancing of monsoon.

D. The Trend of Winter Rainfall at Kerala

Table 1.5 Monthly rainfall of winter

Rainfall	December	January	February
Max (mm)	154.4	40.8	72.6
Min (mm)	0.1	0	0

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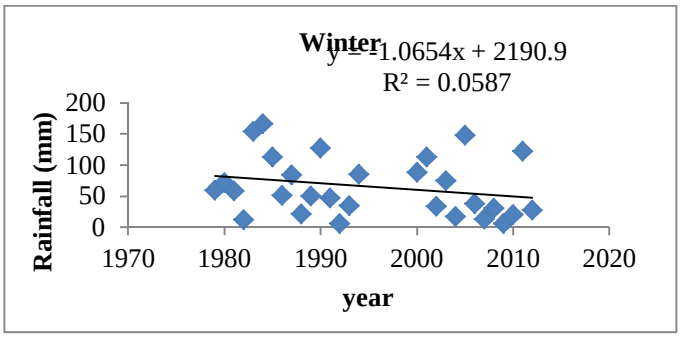

Fig. 4 The trend of winter rainfall

The given table 1.5, represents a thirty three year average rainfall data. In the given data the month December receives maximum rainfall of 154.4mm, January receives 40.8mm and February receives 72.6mm. The month January receives very low rainfall comparing the all other month of Kerala for the study period. Overall study the winter season receives very low rainfall comparing to the other seasons. The average winter rainfall forms the total annual rainfall of 2% which is comparatively lower than all other seasons of Kerala region. In India many studies have been done to investigate the significance of rainfall events with a special concern of monsoonal changes and global warming[1].

V. CONCLUSION

The deficit of rainfall during monsoons results in widespread at agricultural loses and deterioration of economic growth. The study shows that there is a decreasing trend during South West monsoon that brings a lion portion of the annual rainfall to the state and there is an increase in trend during North East monsoon indicates an abnormal rainfall pattern. A long term rate of decrease in annual rainfall is mainly during the months June and July.The long term decreace in South West monsoon and the long term increase in trend during North East monsoon cannot match or compensate each other because altogether there is a deficit of 54% of annual rainfall. The increasing trend of rainfall during Pre-monsoon forming 12% of annual rainfall can be viewed as advancing of monsoon in to the Pre-monsoon period. Winter shows a decreasing trend in rainfall and it receives only 2% of total annual rainfall of Kerala the presence of climate change.Over the study during thirty three years it understood that in Kerala the maximum rain receives the month of July and minimum rain occurs during January.

REFERENCE

[1] S. Balachandran, R. Ashokan and S. Sridharan, “Global surface temperature in relation to northeast monsoon rainfall over Tamilnadu”, J. Earth system Science, 115, 349-362, 2006.
[2] V. Kumar, S. K Jain and Sing, “Analysis of long term rainfall trends in India”, Hydrol. Sci. J., 55, 4, 484-496, 2013.
[3] A. Ramachandran, K. Remya, S. Jayakumar, Divya subash kumar, P.Radhapriya and P. Malini, “Rainfall trend analysis of Kolli Hill, Tamilnadu, India, Mausam, 66, 1, 151-154, 2015.
[4] IPCC, 2001, “Climate change 2001: The Scientific basis”, Cambridge university Press, Cambridge, U.K.
[5] B. Vishnoi , R.C Gupta, Anand Nagar, Kalu Ram Sharma, “Temperature variability and trend over Rajasthan”, Mausam, 66, 1, 145-150, 2015.

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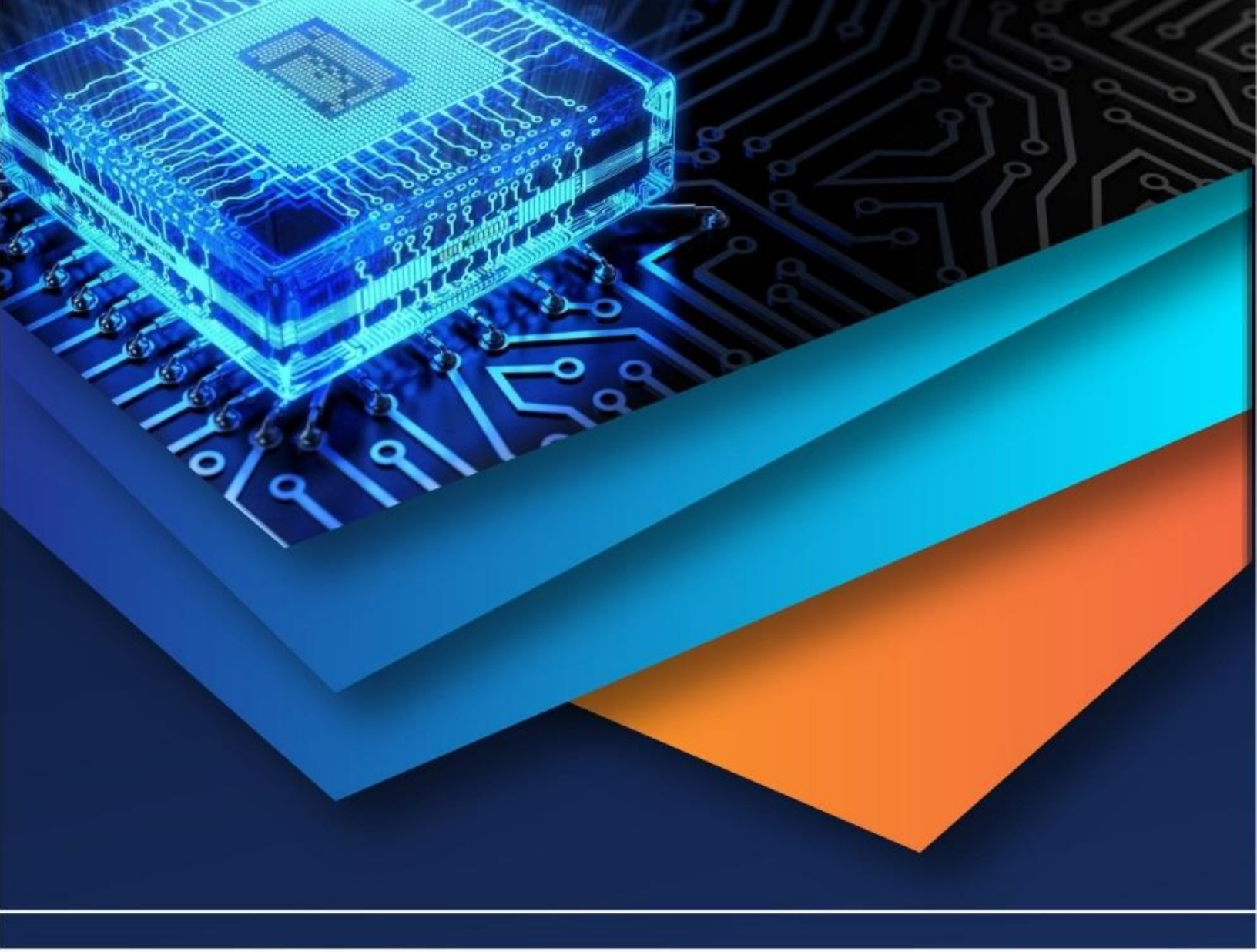

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