PCE080

RAINFALL TREND ANALYSIS USING NON-PARAMETRIC TEST: A CASE STUDY OF JAFFNA DISTRICT, SRI LANKA.

RASENTHIRAM ATHAVAN
UG STUDENT
GUJARAT TECHNOLOGICAL UNIVERSITY
rathavan1995@gmail.com

MOHAMMED SUHAIL
UG STUDENT
GUJARAT TECHNOLOGICAL UNIVERSITY
muhammadhsuhail16369@gmail.com

DARSHAN J MEHTA
ASSISTANT PROFESSOR
DGGEC, SURAT
darshanmehta2490@gmail.com

Abstract

Rainfall is a vital climatic factor which can affect the development and progress of a nation. Analysis of rainfall trend plays a major role in studying the impacts of water resources and agriculture activities. Variations in rainfall and other forms of precipitation are most unavoidable factors which determine the overall impact of all seasons. The current study is centered to analyze the trends in the annual and seasonal (Pre-monsoon, Monsoon, Post-monsoon) total rainfall at Jaffna district, North of Sri Lanka by using the available 44 years (1972-2015) monthly rainfall data of rain-gauge station at Tirunelveli. The trend analysis was carried out by using Mann-Kendall test and Sen's slope estimator. The study area is characterized by average rainfall which receives an annual average rainfall of 1298 ± 683 mm but the long-term trends in the analysis of the annual rainfall indicates an increasing of the trend (+2.058 mm per year) and annual rainy days which also had insignificantly decreased (-23.625 days per year). The graphical representation of the trend in annual and seasonal rainfall series expressed by Mann-Kendall Z_c value seasonally, Monsoon (0.017), Post-monsoon (0.196) and Annual (0.055) are showing positive trend and Pre-monsoon (-0.135) depicting negative trend. Sen's Slope estimator also reflects the increase during the Monsoon (0.504), Post-monsoon (1.649), Annual (2.058) and decreasing in Pre-monsoon (-1.967) magnitude of slope in correspondence with the MK test values. Annual and seasonal analysis resembles both positive and negative trend in the area although not significant (P>0.05).

Key words: Jaffna district, Mann-Kendall test, Sen's slope estimator, Rainfall trend.

INTRODUCTION

Water is one of the most important substance in the universe, which greatly known to be the essence of all life. Water exists in three states of matter such as gas, solid and liquid. The identical characteristics of water makes it very special in the universe and its life sustaining chemical properties have nurtured life on earth for centuries of years. Researches have portraited that global warming is occurring at a rate of 0.74 ± 0.18°C in between the period of 1906-2005 (*IPCC, 2007*). According to the IPCC reports there will be an imbalance in rainfall trend due to the climate change. These studies show that by the middle of the 21st century, there will be a decrease in runoff and available fresh water up to 10-30% (*IPCC, 2007*). Exploration of different time series data are indicating that rainfall trend is either falling or rising.

OBJECTIVES

ISBN: 978-93-5351-069-5