

(ID 205)

Assessment of the Vulnerability of Paddy Cultivation to Impacts of Climate Change in Kurunegala District in Northwestern Province, Sri Lanka

Rathnayake, R.M.A.*, Ranasinghe, D.M.S.H.K.

*Department of Forestry and Environmental Science, University of Sri Jayewardenepura,
Nugegoda, Sri Lanka*

*apeksharathnayaka111@gmail.com

Abstract

Rice serves as the staple food for most of the Sri Lankans, playing a crucial role in ensuring the country's food security. Climate change has brought about some negative impacts on paddy cultivation in Sri Lanka. This study aims to assess the vulnerability of paddy cultivation to the negative effects of climate change in Kurunegala District, Northwestern Province, Sri Lanka. A combination of secondary and primary data was employed in this study. Secondary data encompassed the analysis of average annual and monthly rainfall and temperature variations in Kurunegala District from 2010 to 2020, as well as the occurrence of droughts and floods in the same period. Additionally, the study examined the variations in average annual paddy yield in Kurunegala District from 2010 to 2020. For primary data collection, Climate Change Vulnerability Indices (CCVI) were employed, which included indicators, exposure, sensitivity, and adaptive capacity. Under the exposure indicator, climate exposure, biophysical exposure, and biological exposure were considered. Sensitivity was assessed through social, financial, and farm sensitivity sub-indicators, while adaptive capacity was evaluated using socio-economic, agricultural, and institutional capacity sub-indicators. The field sampling focused on divisions with significant paddy lands that depend on minor irrigation and rainfed cultivation, such as Mahawa and Narammala. Mawathagama, which had fewer paddy lands and a population engaged in non-paddy-related activities, was used as a control. Two Grama Niladhari (GN) divisions from each selected Divisional Secretariat (DS) division were randomly chosen for detailed sampling. In each GN division, 50 families were randomly selected to participate in semi-structured questionnaire surveys supplemented with focus groups discussions and key informant surveys. The collected data were used to create a vulnerability map for Kurunegala District through GIS analysis. The study results revealed that while the annual maximum and average temperatures from 2010 to 2020 did not exhibit significant variations, the annual minimum temperature demonstrated an upward trend. In terms of vulnerability, Narammala DSD exhibited the highest vulnerability followed by Maho DSD with the lowest vulnerability observed in Mawathagama DSD.

Keywords: Climate Change, Paddy Cultivation, Adaptation Measures, Vulnerability Assessment, Kurunegala