# Dynamics of potential precipitation under climate change scenarios at Cameron highlands, Malaysia


## ABSTRACT

Precipitation is sensitive to increasing greenhouse gas emission which has a significant impact on environmental sustainability. Rapid change of climate variables is often result into large variation in rainfall characteristics which trigger other forms of hazards such as floods, erosion, and landslides. This study employed multi-model ensembled general circulation models (GCMs) approach to project precipitation into 2050s and 2080s periods under four RCPs emission scenarios. Spatial analysis was performed in ArcGIS10.5 environment using Inverse Distance Weighted (IDW) interpolation and Arc-Hydro extension. The model validation indicated by coefficient of determination, Nash–Sutcliffe efficiency, percent bias, root mean square error, standard error, and mean absolute error are 0.73, 0.27, 20.95, 1.25, 0.37 and 0.15, respectively. The results revealed that the Cameron Highlands will experience higher mean daily precipitations between 5.4 mm in 2050s and 9.6 mm in 2080s under RCP8.5 scenario, respectively. Analysis of precipitation concentration index (PCI) revealed that 75% of the watershed has PCI greater than 20 units which indicates substantial variability of the precipitation. Similarly, there is varied spatial distribution patterns of projected precipitation over the study watershed with the largest annual values ranged between 2900 and 3000 mm, covering 71% of the total area in 2080s under RCP8.5 scenario. Owing to this variability in rainfall magnitudes, appropriate measures for environmental protection are essential and to be strategized to address more vulnerable areas.



**Keyword:** Hydrology; Rainfall erosivity; Soil erosion; Ensemble GCMs; PCI; GHGs emission