**Soil erosion risk under climate change scenarios: A case study in rural area with varying land uses**


## ABSTRACT

Soil erosion is one of the major issues in the tropics. The erosion is highly affected by the changes in climate and land cover. Future changes in tropical climate, particularly precipitation are expected to influence the potential risks of soil erosion. In the face of rapid changes in rural land cover for agricultural purposes, the combined forcings of land cover and climate changes have been to be a major threat to the soil conservation due to soil erosion. In this study, climate change scenarios at the northern part of Borneo were developed based on the RCP 4.5 and RCP 8.5 climate scenarios using Weather Research Forecast Model (WRF). The future climate projection scenarios of the total precipitation were used to simulate the potential erosion risks in varying land covers in a rural area of Sabah, Malaysia. The RUSLE model was used for soil erosion modelling, which was integrated with IDRISI Selva that allow the analysis and assessment of erosion risk. The variability of future total precipitations in the area of varying land cover types have resulted in varying degree of potential soil erosion risk The average soil loss at the studied area has increased by 262 t/ha/yr with 35.94 % increment in annual precipitation under RCP 8.5 emission scenario. However, under RCP 4.5, 26.65 % decrement in precipitation has reduced the soil loss by 315.1 t/ha/yr. In this rural area, exceptionally high soil erosion was found at steep slopes and thin vegetation covers. Therefore, an appropriate land use planning, soil conservation practices, and strategic adaptation options plan should be created and developed to ensure the sustainability of the soil conservation and enhance rural agricultural productivity.