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Assessing the impact of rainfall regimes and crop management practices to soil erosion in agricultural watershed using simulation model: A decision support tool in conservation planning and climate change adaptation in upland agriculture

Orlando F. Balderama

Department of Agricultural Engineering, Isabela State University, Philippines

Email: orly_isu@yahoo.com

Abstract

The study was conducted in July 2011 to June 2012 at the Isabela State University watershed experimental. Primary goal is to evaluate the performance and adaptability of the Water Erosion Prediction Project (WEPP) model in estimating the rate of soil erosion and run-off under upland rice cultivation. The research involves establishment of automatic weather station, small farm reservoir and erosion plots with three conservation management as treatments. Analysis was undertaken to characterize rainfall events in terms of amount, intensity, duration and frequency in relation to erosion data. Comparison of actual and simulated data and sensitivity analysis of scenarios for different types of rainfall, slope, and conservation practices were made. Validation result demonstrated statistical acceptability of the WEPP model. Actual and simulated data indicated that 50% soil loss is reduced when contour planting with hedgerow are practiced. The rate of sedimentation is linearly affected by increasing slopes and length, such that, the rate of soil removal ranges 1.2 t/ha to 48.46 t/ha across treatments at 10%-50% slope and 10 m-40 m slope length. The model can be use to develop decision support tools for conservation, optimization and utilization of farm resources in agricultural watershed units to improved productivity of upland areas in sustainable way.

Biography

Orlando F. Balderama has 26 years of work experience as Professor, Researcher, Research and development Administrator, Project Development Specialist and consultant to various soil and water related projects. He is a focal person of Climate Change Projects on Adaptation Strategies for Land and Water Resources Management including Integrated Water Resources Management Approach by the Philippine Commission on Higher Education, River Basin Control Office and Bureau of Agricultural Research. He also coordinates a Center for Climate Change – Education Research and Development.