Abstract

The Philippines is strategically located in the equatorial region, receiving the impacts of climate change, that in 2022 it ranks first as the most disaster-prone country (World Risk Index). Moreover, the agriculture sector is among the most impacted (Bandara & Cai, 2014) by this changing climate as manifested by flooding and drought.

The Central Luzon State University is a premier university in the country, known for its academic and research excellence in agriculture and allied fields. National and local government agencies collaborate with CLSU, specifically Institute for Climate Change and Environmental Management, College of Science and Department of Agriculture and Biosystems Engineering, College of Engineering, to prepare comprehensive land use plans using GIS, develop agricultural land use allocation, predict water resources availability and demand for irrigation and use decision-making tool for water management for agriculture. Though the faculty, staff and students are equipped with planning and analysis tools, the lack of an integrated water planning system leaves a large vacuum.
The Philippine Rice Research Institute is collaboratively working with CLSU to develop a comprehensive agricultural land use allocation of the rice-producing provinces of the Philippines in response to climate change and food security. Several factors are considered: land suitability, farmer's income, product marketability and climate-related disaster risk, to be processed in multiple goal linear programming software. One major constraint set is the water resources of the planning area where the supply and demand are established to generate a realistic land use allocation. The Water Evaluation and Planning (WEAP), developed by Stockholm Environment Institute, is an integrated approach to water resource planning. The WEAP will fill in the missing link to quantify the future water shortages because of climate change. It thus contributes to generate an optimum agricultural land use allocation.

There is a pressing need for capacity building in the use of the WEAP system for CLSU personnel, students, and other stakeholders, such as the Philippine Rice Research Institute, to create effective water resource plans and inform policy decisions. The WEAP practitioner from the Department of Land, Air and Water Resources, College of Agriculture and Environmental Sciences, University of California Davis can train these people by going through the procedures of running the model and addressing concerns and issues in using the software. Additionally, integrating WEAP into the curricula of undergraduate and graduate programs in Agriculture and Biosystems Engineering at CLSU is essential for its sustainable application.