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# HINDU KUSH HIMALAYAN (HKH) FOOD SECURITY: UTILIZING NASA'S EOS DATA IN THE DSSAT CROP MODEL TO RESEARCH THE POTENTIAL EFFECTS OF CLIMATE CHANGE ON FOOD SECURITY IN HKH REGION

**Abstract**

The goal of this research is to improve environmental management and climate change preparedness by strengthening the relationship between scientists and governments using geospatial technologies to improve the food security in the Hindu Kush Himalayan (HKH) region. We will assess the impact of climate change on agricultural yields in developing countries. Using the normalized differential vegetation index (NDVI) as a proxy, from we will study surface cover types from NASA's Terra satellite (ASTER/MODIS) to assess the vitality of crop vegetation currently, vegetation health of specific cultivars and roughly determine the seasonal phenology of three major crops for the region. Climate change predictions can be accessed through the SERVIR climate-mapper, SERVIR-VIZ, which uses NASA satellite data to predict future changes in climates worldwide. Threats to food security over the next 50 years will be measured using specific changes in climatic variables (from SERVIR-Viz) in a crop simulation, DSSAT (Decision Support System for Agro-technology), a point data system used to determine crop yield. DSSAT is a computer software system designed to predict growth and yield for more than 25 crops, to assist in producing successful crop management techniques, and to provide alternate options for decision making (Tsuji et al. 1998; Hoogenboom et al. 2004). The DSSAT models use variables such as weather, soil type and profile properties, cultivar specific inputs and management criteria for simulating growth, development, and yield. The specific variables governing plant growth (soil moisture, temperature and sunlight) from the SERVIR-VIZ predictions will be used in the DSATT crop model to determine crop yields under climate change scenarios. Increasing demands from population growth and industrialization are placing more pressure on food production. This means that already existing crops will be stressed further and more pressure placed on current growing zones to respond efficiently and effectively. Understanding environmental parameters is the first step in a proactive approach toward the effects of climate change. The major finding for this study will be in determining the impact climate change could have on regional food security and help promote geospatial technologies as a part of decision making for sustainable development. Knowledge of regional ecosystem fluxes will help climate-sensitive socioeconomic sectors respond to changing conditions. In this way, geospatial data will be leveraged to integrate satellite observations in models along with other geographic information to monitor and predict ecological changes.