

Assessment of Meteorological Factors Associated with Tropical Cyclone Induced Rice Damage Using Remotely Sensed Vegetation Indices in the Cagayan Valley

Gabriel Mesina

Adviser: Dr. Bernard Alan Racoma

Institute of Environmental Science and Meteorology, College of Science, University of the Philippines – Diliman

ABSTRACT

Tropical cyclones (TC) inflict widespread disruption to economies and communities. Among the variety of TC induced damages, rice crop damage is especially pertinent to the Philippines given the socio-economic significance of the crop. Efforts to understand the mechanisms behind TC rice damage have evolved significantly in recent years. Recent literature has explored the possibility of mapping TC damages, especially vegetation damage through vegetation indices. This existing body of literature presents an opportunity to spatially assess the localized impacts of TCs, moving beyond administrative-level statistics to explain the predictors of rice crop damage. The present study seeks to address this gap by evaluating rice damage in Cagayan Valley, one of the country's primary rice-producing and TC active regions. Differences in Normalized Difference Vegetation Index (NDVI) and Enhanced Vegetation Index (EVI) will be used to assess grid-level post-TC rice crop damage. These assessments will then be integrated with parametric wind field modeling and satellite precipitation data within a geostatistical model to identify the primary spatial drivers of TC rice damage. Ultimately, the present study attempts to deepen the understanding behind the nature of TC induced rice damage in support of disaster risk reduction policy and agricultural resilience planning.

Key words: tropical cyclones, rice, vegetation indices, remote sensing