The Development of an Automation Tool for Processing Vegetation Health Index (VHI) for Monitoring Agricultural Drought for Rice in every Municipality in the Philippines

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Abstract: Extreme drought events are happening in some regions in the Philippines since 2018 and still experiencing in this year 2019. Most affected by this event is in the agricultural sector, especially the Rice farmers. The government of the Philippines under the Department of Agriculture (DA), The Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA), and other NGOs are on the move to plan and help the affected farmers to aid them and prepare them for the El Niño breakout. Some of these agencies here in the Philippines using remote sensing application that provides early warnings of agricultural drought for their preparation and response interventions, and by using Vegetation Health Index (VHI) as their basis for determining drought in that affected area in the country. Existing tools and data sets are very limited in providing timely and reliable risk and damage assessment data required to inform decision-makers to plan for effective and efficient preparedness, response, early recovery, and rehabilitation activities. It takes days and in oftentimes, weeks to collect, consolidate, and verify crop damage data. To support this, the researchers developed an automation tool to elevate the slow process of drought assessments. The researchers designed this tool using python from automating download dekad files till producing a Vegetation Health Index (VHI) for each municipality in the Philippines. VHI is derived from the Temperature Condition Index (TCI), Vegetation Condition Index (VCI), and the weight parameter for rice. The corresponding VHI pixels in that municipality will be automatically computed their mean VHI value. VHI values are ranged between 0 to 1.0, and when the mean VHI value of the municipality is less than 0.5, the rice condition of that municipality experiencing drought. The tool automatically writes all the computed mean in every municipality in a JSON file. This JSON file can be used in any online GIS web-based platform for displaying VHI conditions in every municipality in the Philippines.

Keywords: VHI, GDAL, Python, Drought Monitoring, Rice.