

Global Food Security Analysis using Satellite Remote Sensing Data

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Food is fundamental to human well being and development. Increased food production remains a cornerstone strategy in the effort to alleviate global food insecurity. However, drought and temperature conditions are affecting agricultural production. Furthermore, increased population and income growth fueled the global demand of crop yields. Population may be experiencing gaps in food consumption. The objective of this project is to understand the relationship between population, economy and climate change in different countries and how it may impact accessibility to agricultural food production.

In this project, students will select 10 countries around the world and will investigate countrywide crop production with MODIS normalized difference vegetation index (NDVI) data over the last 10 years. The crop production data will be analyzed temporally with a variety of parameters, namely population growth, economic indicators and climatic indicators (drought and precipitation) to identify per capita food availability. The economic indicator will be income per capita. To quantify the severity of droughts and precipitation, The Palmer Drought Severity Index (PDSI) will be applied.

Satellite imagery over the selected period of time from MODIS by NASA will be used to estimate crop yield. The collected data of the studied parameters will be processed by using GIS to plot graphs that will show the correlation between parameters for each country and MATLAB will be utilized to forecast future implications that these parameters would have on food distributions for each country.

Keywords: Global food insecurity, Population Index, Crop yield, Gross National Income

Tools: GIS, MATLAB

Remote Sensing Data: NDVI data