NDVI stratified sampling to determine threshold losses in rice crop. A case study in Babahoyo canton, Ecuador

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Based-index insurance for farming has become in an efficient alternative for farmers to transfer risk to another instances. Actually, in Ecuador, there is a conventional agricultural insurance for rice crop, although it is necessary to develop based-index insurance that could cover more farmers for extreme events with catastrophic consequences. This based-index insurance could consist to estimate crop losses by drought through NDVI (Normalized Difference Vegetation Index).

A first step was to establish homogeneous areas based on Principal Component Analysis of soil properties (Valverde et al., 2016) where rice is cultivated. Two main areas were found (f7 and f15) that was based mainly on slope, texture and effective depth. These ones are the sites considered to sampling and study the NDVI.

MODIS images of 250x250 m resolution were selected of the study area, Babahoyo canton (Los Rios province, Ecuador), and calculated the NDVI index at rice growth stage in both sites at several years. The number of samples in each site was proportional to the area of cultivated rice.

NDVI distribution values were calculated in each homogeneous zones (f7 and f15) through years. Several statistical analysis were performed to investigate the difference between both sites. Results are discussed in the context of based index insurance.