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Rice Drought Risk Map validation using agricultural insurance data: a novel approach

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A Drought Risk Map (DRM) for rice in Babahoyo Canton (Ecuador) was established including rain levels and the effects of soil characteristics on production risks when triggered by drought. This is especially important for this case study, in which climatic conditions are not very limiting for this crop. Then adjusted DRM considers irrigated rice crop areas experiencing reduced vulnerability resulting from water availability approaching real farming conditions.

To validate our approach we only had agricultural insurance data and included the following: insured area of rice crops in the winter (January to March), area of rice crops affected by drought, and claim reports of drought for each rural district of Babahoyo canton being a total of 6 districts. These data cover the period running from the onset of agricultural insurance in 2010 to the winter of 2016. This information was provided through the Agroseguro project, which trades conventional agricultural insurance in Ecuador.

A comparison of DRM and DRcM maps, in which the difference is the inclusion of soil characteristics, was conducted through a statistical test.

A likelihood function based on insured area (h(i,s,k)), of a risk category (k), in a district (i) and year type (s) was defined and applied for each map. Then to know which map better explains the 2010-2016 agricultural insurance data, the logarithm of the ratio of both likelihoods were used. The test concluding that taking in account soil characteristics the insurance data is better explained.

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