The Chilean Agroclimatic Observatory: decision support for climate risk management

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Abstract

In order to move away from crisis management, the Chilean Government entrusted the Unit for Agricultural Emergencies (UNEA) with the development of a Climate Risk Management (CRM) strategy. One of the decisions adopted was the creation of a National Agroclimatic Observatory to allow informed decision making related to droughts, as well as other climatic hazards (heat waves, frost and extreme rainfall events). In collaboration with UNESCO-IHP, the International Research Institute for Climate and Society (IRI), the FAO and The Water Centre for Arid Zones (CAZALAC), a framework for CRM has been implemented, establishing a decision support system for climate informing decisions in the agricultural sector.

A key element in the development of this Agroclimatic Observatory consisted in the establishment of a local Chilean climate data repository, using the Climate Data Library technology developed at the IRI. In order to provide effective decision support tools, a user-friendly interface was built on top of the Climate Data Library, constituting the portal of the Agroclimatic Observatory, in order to service final stakeholders with tailored information for decision making.

Following the framework for Climate Risk Management (Baethgen, 2010), the Observatory was built to reduce climatic uncertainties around three pillars: (i) understanding the past behavior of climatic variability at different timescales; (ii) monitoring the present conditions of relevant environmental factors; and (iii) providing the best possible climate information of the future.

To provide relevant historical information, the Chilean Drought Atlas was developed, which indicates expected drought frequencies for different drought intensities and durations based on a modified Regional Frequency Analysis using L-moments

An important part of the effort was focused on developing effective drought monitoring indicators, using both national and remote sensing data sources. Four variables were marked as essential: climatic variables (precipitation/temperature), streamflow, soil moisture and vegetation. In the third component, uncertainty on future drought events is reduced by providing a seasonal drought forecast, with up to four months of lead time. As such, the drought risk can be visualized in a spatially distributed manner, and allows advanced drought planning and early response to specifically affected sectors. The Agroclimatic Observatory is accessible at http://www.climatedatalibrary.cl/UNEA/maproom/