
Increasing food security in Asia through satellite-based information and insurance

Rice is one of the most widely grown crops in the world, and it is by far the most important food crop for the poor: more than 3.5 billion people depend on it worldwide. Over 90% of the world's rice is produced in Asia where farmers grow their crops on small-holdings of the size of one or two hectares. While the Asian population grows rapidly, commodity prices are rising and the available arable land area is decreasing. In most Asian countries, rice availability is equated with food security and closely connected to political stability: rice price increases have caused social unrest in several countries during the food crisis of 2008.

The objective of this project named "RIICE" (Remote sensing-based Information and Insurance for Crops in Emerging economies) is to reduce vulnerability of small-holder farmers engaged in rice production in two ways:

- a. Increase the information on rice growth areas and expected yields to help governments, agricultural intermediaries and relief organizations in better managing domestic rice production and distribution both during the normal growing cycle as well as after natural catastrophes struck.
- b. Provide access to insurance solutions for governments, agricultural intermediaries (such as cooperatives or rural banks) and individual rural farmers to cushion the financial effects on farmers that stem from natural catastrophes such as flood and drought – the major causes for crop destruction in Asia.

In achieving those two goals, the partners of RIICE make use of remote sensing technology, based on satellite data provided mainly by the European Space Agency. This data differs from "traditional" image-based satellite data, in that it is radar-based and is hence available regardless of weather conditions; (radar can "view through the clouds").

It is expected that rice production will increase in the long run due to better access to information about the actual growth status of observed rice crops and the forecasted yields (as well as about damages and forecasted losses of rice crops), hence leading to a better land management by farmers. Furthermore, crop insurance is often made an indispensable condition to obtain an agricultural loan by a rural bank. Agricultural credit in turn will spur investment into higher yielding crop sorts.

The RIICE project focuses on rice-growing areas in seven Asian target countries, namely Bangladesh, Cambodia, India, Indonesia, the Philippines, Thailand and Vietnam. A public-private development partnership is implementing the project. The partners are sarmap SA, a Swiss-based technology company supplying the necessary remote sensing technology; IRRI, (International Rice Research Institute) with headquarters in the Philippines, collecting field data estimating rice yield; Allianz Re providing insurance services to small-holder farmers as beneficiaries; and GIZ, the German Development Cooperation, providing capacity building to local aggregators through the programme develoPPP.de on behalf of BMZ. The Swiss Agency for Development and Cooperation, SDC, is the main funder of the project.



During the next years until 2015, the RIICE partners will concentrate on the following four operational milestones:

In order to reliably **(1) map and monitor the rice growing areas** of the seven Asian target countries, sarmap is currently mapping these geographies using high resolution imagery. As a result, RIICE will be able to present governments in the target countries as well as other stakeholders a “rice map” which indicates the areas where rice is grown during how many crop seasons as well as the cultivation method used. In a further step, sarmap will monitor the crop growth while IRRI and local partners will perform tests on the ground to calibrate the observations from space and use them – along with weather, crop management and soil information – to develop a remote sensing driven crop growth model to **(2) estimate actual rice yields**.

In order to forecast expected rice yields, IRRI and local partners will obtain historical weather data to represent a range of plausible future weather scenarios, and combine this with the early season remote sensing information and the method developed in (2) to make **(3) yield forecasts** already in the first months of a cropping period.

In order to tailor a **(4) suitable insurance product**, RIICE works on the assumption to provide insurance to individual farmers, aggregators (such as the agricultural loan portfolio of a rural bank) or political jurisdictions (such as a municipality or even a state). Once the insurable units are mapped using geo-referenced data, the yield estimates for the insurable area can indicate the amount of potential damage and hence the potential loss of yield for that given area. The insurance product would therefore be structured as an area-yield insurance product. The insurance cover would be triggered with the actual insured calamity happening (e.g. a flood, observed through remote sensing) and in some instances the government declaring the areas as a national disaster zone or similar. In case the insurance loss cannot be ascertained using remote sensing technology, a field adjuster would have to be sent to investigate.

RIICE is expected to improve existing agricultural insurance solutions and help to establish new ones that are more transparent and sustainable given the use of remote sensing technology. At the same time, RIICE is geared to provide more precise and timely information to governmental institutions, allowing them to make better decisions to enhance food security in the target countries.

Disclaimer: This project description is targeted to immediate project partners

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