



CCAFS Regional Agricultural Forecasting Toolbox (CRAFT): monitoring the impact of adverse weather on crop yields



Photo credit: Neil Palmer

Reliable and timely crop yield forecasts is critical for informed planning and policy decisions on food production, marketing, export/import, distribution and the overall food security in the country. The conventional approach of crop yield forecasting is a time consuming, costly exercise and suffers from delays in processing the results.

The CCAFS Regional Agricultural Forecasting Toolbox (CRAFT) for South Asia uses historical databases of weather and crop yields and current weather to estimate yields of various crops in advance. It can provide policymakers and stakeholders precise information on the likely volume of crop production in specific areas at different times of the year. The tool also supports the efforts of governments, policymakers and scientists to anticipate the impacts of climate variations on crop production and helps in agricultural and food security management decisions. CCAFS in South Asia has been closely working with stakeholders in the region to enhance their capacity in crop yield forecasting. This CRAFT toolbox was piloted in Bangladesh, India, Nepal and Sri Lanka.

Objectives

- To provide information for better management of agricultural risks associated with increased climate variability and extreme weather events.
- To enable policymakers and other stakeholders to make timely decisions based on in-season crop production forecasts.

Locations

Bangladesh, India, Nepal and Sri Lanka

Partners

India Meteorology Department (IMD), Indian Council of Agricultural Research (ICAR), Centre for Environmental and Geographic Information Service (CEGIS), Bangladesh, Nepal Agriculture Research Council (NARC) and Nepal Development Research Institute (NDRI), Natural Resource Management Centre (NRMC), Department of Agriculture, Sri Lanka.

Approach

- The CRAFT toolbox was launched in 2013. It provides support for spatial input data and spatial crop simulations, integration of seasonal climate forecasts, spatial aggregation and probabilistic analysis of forecast uncertainty, calibration of model predictions from historic agricultural statistics and analysis and visualization. It is currently based on the DSSAT group of models that simulate the growth and development of 28 different crops. This will be expanded to include more models.
- It was customised for South Asian countries by including their basic data on historical weather, soils, crops, and management practices for key crops.
- CCAFS invited teams of scientists and stakeholders from Bangladesh, India, Nepal and Sri Lanka to

trainings and workshops to familiarise them with CRAFT's structure and functions.

- Each team is provided support to develop a country-based case study, organise workshops with national and sub-national stakeholders and ensure integration of results into their national food security planning.
- The CRAFT toolbox is continuously updated based on the feedback from stakeholders.

Initial Results

- Partners in each country have developed database for the CRAFT toolbox in 2013. In Bangladesh, CEGIS has conducted case studies in three upazilas of a district for rice and wheat yields forecasting and an impact assessment of climate change. This project will calibrate and validate the CRAFT toolbox and use it for forecasting rice and wheat yields at the national level.
- In Sri Lanka, NMRC has developed a comprehensive database for the CRAFT toolbox to conduct rice yield forecasting in Amapara, Batticaloa and Pollonnaruwa districts. Several test runs were performed with district level datasets. The toolbox is being calibrated and validated for national level rice yield forecasting.
- In Nepal, NDRI in collaboration with Nepal Agricultural Research Council has tested, calibrated and validated the CRAFT toolbox for rice, wheat and maize crops in two districts (Rupandehi and Chitwan). The results show that the toolbox customized for the South Asia Region was able to forecast the crop yields very well. This validated and calibrated model is being used at the national level for forecasting yields of major cereal crop in 2014.
- In India, studies have shown that CRAFT is capable of simulating sub-national and national crop production for wheat.

ABOUT CCAFS

The CGIAR Research programme on Climate Change, Agriculture and Food Security (CCAFS) is a strategic partnership of CGIAR and Future Earth, led by the International Center for Tropical Agriculture (CIAT).

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