

# FORECASTING NUMBER OF DRY DAYS FOR THE BENEFIT OF FARMERS AND RICE PRODUCTION IN THE PHILIPPINES

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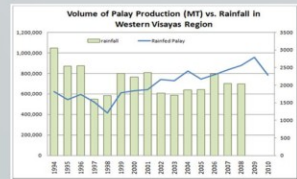
## Climate and Rice

- Food security poses a great threat from unpredictable changes in climate and recently,
- The importance of climate, as an agricultural aspect, is crucial if the geographic situation, ENSO and global warming are taken into account (WMO, 2004);

Timing of different activities like harvesting of palay is most effective during dry days; also drying should be done over several dry days so that rice grains (*palay*) have enough time to dry.

If the grain is threshed while it is damp, it becomes predisposed to damage (Kuisma, 1995);

- Despite the growing use of irrigation, rainfed rice production remains a vital source of income in the Philippines—in particular, for poorer farmers (Hossain *et al* 2000)

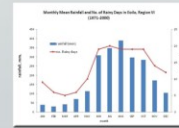


The production trend clearly shows the impact of 1997-1998 El Niño events. The loss in production emphasised the prerequisites for climate forecast for viable decision making to cope with rainfall variability.

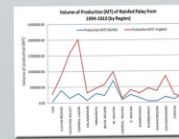


Map of Western Visayas (Region VI) with six provinces that correspond to the study area

## Study Area



Monthly mean rainfall and number of rainy days in one of the meteorological stations in Region VI



Volume of Palay Production of from 1994-2010 showing Western Visayas Region with highest rainfed rice production

## Research Questions:

- What new climate information can be integrated and utilised for the benefit of farmers and rice production in the Philippines?
- How can seasonal dry day forecast be introduced to and accepted by farmers of Western Visayas Region as a new tool for agricultural planning and decision-making to enhance their preparedness to climate variability?

## Data and Methods:

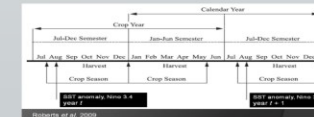
Daily rainfall data - from three meteorological stations in Western Visayas Region (Iloilo, Roxas, Negros Occidental) established by Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA).

Dry day index - a day with 1 mm of rain or less; processed using a Java tool that calculates number of dry days and rainfall total

SST training data and forecast file - ASMC-NEA, Singapore website

Agricultural data - Bureau of Agricultural Statistics (BAS)

constructed the time series, built the regression model and then analysed using the Climate Predictability Tool (CPT v10.9) of International Research Institute (IRI) for Climate and Society, in a 5-length cross-validation window. The CPT is also designed to perform model validation and produce forecast given predicted SST data (Mason, 2005).



Timeline used for statistical regression model

## Dry day forecasting and Communicating with farmers

In the Philippines, the use and dissemination of climate forecast are complex issues and maybe impeded by financial, technical and cultural barriers, thus an effective forecast communication is needed.

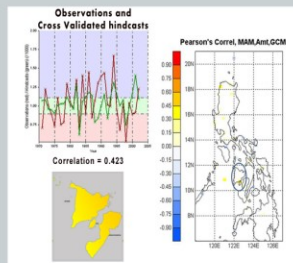
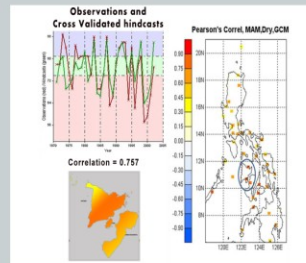
### Result of such analyses lays an important outcome

To build an effective forecast communication, in the context of tailoring information for agricultural risk management applications

- as a potential operational seasonal dry day forecast product by the national meteorological and hydrological centre of the Philippines (PAGASA) for the benefit of farmers and various stakeholders.

The emergence of the Climate Field School in the study area was identified as an instrument to introduce the new type of forecast information and continue its activities in incorporating weather and climate information in decision making for agriculture by the national and local agricultural officers as well as enhancing the capacity of local farmers, extension workers and other stakeholders on the use, access and understanding of seasonal climate forecast.

## Dry day is more predictable than rainfall amount



The statistical model showed that the correlation is higher for number of dry days, 0.757 than rainfall amount with correlation of 0.423 during March-April-May season, an indication of more predictability. During October-November-December (OND) season, correlations for dry days and rainfall amount are 0.510 and 0.485, respectively. Thus, seasonal dry day forecast is more skillful than models that try to predict the seasonal rainfall amount.