SCF Project Updates

Bridging the gap between seasonal climate forecasts (SCFs) and decisionmakers in agriculture

Vol. IV No. 2 (June 2008)

Evolution of the 2007–2008 La Niña episode and the climate scenario

In July 2007, signs of an evolving La Niña episode were already confirmed which later developed into a full-blown La Niña, albeit a weak one, in September 2007. This then reached its maximum strength in February 2008. By May 2008, though, transition from this cold event to a neutral condition began to be observed and this month—June—the La Niña episode is expected to end.

Developments that unfolded

The onset of La Niña toward the last quarter of last year brought to an end the June–July 2007 dry spell condition experienced in Regions 1, 2, Cordillera Administrative Region (CAR), National Capital Region (NCR), and Central Luzon (see story on the 2007 dry spell in Luzon in the *SCF Project Updates* issue of September 2007). With it came a significant increase in rainfall volume as three tropical cyclones immediately entered the Philippines' area of responsibility (PAR) in August 2007, followed by another rainy month in September with the coming of another three cyclones, namely, *Falcon*, *Goring*, and *Hanna*. These disturbances, especially *Hanna* which crossed the country, brought heavy rains, widespread flooding and landslides over Western Visayas and some areas of Luzon. This was the time when the southwest monsoon was active.

As the transition period from the southwest to the northeast monsoon season took place in October, the presence of the ridge of high pressure area persisted over Luzon, signifying generally good weather with below normal rainfall condition for the area. Unfortunately, for the other parts of the country like the Visayas and some areas in southern Mindanao, this was not the case as they experienced above normal rainfall, bringing in floods and landslides in certain places. The La Niña gathered moderate strength and from November to December 2007, affected the country's climate through the enhanced northeast monsoon by bringing in three tropical cyclones that crossed the country and thereupon causing widespread rains and landslides in most areas of Luzon, some areas of the Bicol region, and southern Mindanao.

La Niña conditions intensified in January 2008 and as earlier mentioned, reached maximum strength last February. The cold event enhanced the northeast monsoon activity which in turn brought massive flooding and

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landslides over most areas of the Visayas, Bicol region, and Mindanao due to the week-long rains. In Borongan, Eastern Samar, the historical record of "highest 24-hour rainfall" of 298.5 mm registered on February 10, 1939 was surpassed, setting a new record for the country on February 14, 2008 at 371.4 mm. No tropical cyclones, however, developed or entered the PAR during the period.

Signs of a weakening of the cold event were observed by March, after La Niña reached its peak in February, as manifested by the warming in the eastern equatorial Pacific Ocean.

In the meantime, the period from mid-March to June normally represents the warmest months of the year. The hot condition is usually seen as a precursor to thunderstorm activity. The northeast monsoon season came to an end in late March and the transition to the southwest monsoon season took place in April. By mid-April, the first tropical storm for 2008—*Ambo*—entered the country.

The "official" onset of the rainy season associated with the southwest monsoon, though, began in the middle of May 2008, with the passage of tropical storm *Cosme* which developed in the South China Sea. *Cosme* was not supposed to touch land in the country but its movement toward an exit to the northwest was blocked by the presence of the ridge of high pressure area whose axis extended north of the Philippines toward Southern China and Thailand. And with the simultaneous development of typhoon *Dindo* in the northeastern section of Luzon, *Cosme's* movement was pulled and propelled by *Dindo* toward the northeastern direction. The interaction of these two tropical cyclones thereupon caused *Cosme* to make a landfall in western Pangasinan and to cross the country as it raced toward northeastern Luzon, causing massive destruction to properties, agriculture, fisheries, and infrastructures along the path that it crossed due to its torrential rains and strong winds. As reported by the National Disaster Coordinating Council (NDCC), overall damages reached more than PhP180 million, particularly in Regions 1, 3, and the Cordillera Administrative Region (CAR).

Two more tropical cyclones entered the country in May, making a total of four and setting the highest record of typhoons for the month since 1948. Above normal rainfall in most parts of the country, especially over the Visayas and parts of Northern Luzon, was experienced.

Just recently this month (June), typhoon *Frank* wrought havoc to lives, properties, infrastructures, agriculture, fisheries, and the maritime industry in the Philippines worth billions of pesos as massive flooding, flashfloods, landslides, and storm surges took place in several provinces, especially in Western Visayas, where they have been declared to be under a state of calamity even several weeks after the onslaught of the typhoon.

Table 1 summarizes the number of tropical cyclones that entered the PAR in the first half of 2008 and indicates how many crossed the country.

The La Niña event is seen to come to an end this June. On the whole, its impact was

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Table 1. Summary of tropical cyclones in the Philippines, January–June 2008

Month	Tropical Depression	Tropical Storm	Typhoon	Crossed the Country
January				
February				
March				
April		1		1
May		2	2	1
June			1	1
Total		**3**	**3**	**3**

Source: PAGASA

SCFs in monetary terms: How much is their worth to farmers?

In Isabela: marginal, individually but significant, on the whole

As part of the ACIAR-funded project "Bridging the gap between seasonal climate forecasts (SCFs) and decision-makers in agriculture," a simulation study was carried out in selected sites in the province of Isabela, with the aim of developing an approach to valuing the contribution of SCFs in decisionmaking under conditions of climate uncertainty.

The study was conducted in Angadanan and Echague, the top two corn-producing municipalities of Isabela province. From the two municipalities, three barangays were chosen based on their land types—river/flood plain, broad plain, and hilly/rolling. The agroclimatic condition, which mainly determines the timing and number of cropping a rainfed farmer can have in a year, is dry to moist for Echague and moist for Angadangan. The traditional corn planting seasons in Echague and Angadangan are April to June for the wet season cropping and October to December for the dry season cropping. Each cropping season lasts approximately 120 days or 4 months.

Historic climatic data (1951–2006) of Tuguegarao,[1] which include daily values of solar radiation (MJ/m2-day), daily maximum and minimum air temperature (C), and daily rainfall (mm), were collected from PAGASA while crop management practices of farmers were gathered using the Decision Support System for Agrotechnology Transfer (DSSAT) program. The DSSAT program is an approach

developed for the purpose of helping provide a more precise SCF and simulates outcomes of corn yield.

Said program allows the simulation of different corn varieties and cropping systems, targeting issues such as climate variability, crop rotations, and management alternatives in generating corn yields. In terms of corn varieties, the only local hybrid variety available in the DSSAT program is the Pioneer corn variety. Thus, even if the survey conducted by the project team did not actually use such variety, corn yields for the areas using the DSSAT were simulated based on this variety for both the wet and dry seasons.

Yields were also simulated under different climate variability conditions, viz, for El Niño (poor year), La Niña (good year), and

[1] Unfortunately, solar radiation data from Isabela are unavailable. The nearest weather station, with similar climatic conditions as Isabela, is in Tuguegarao.

Table 1. Expected gross margin (PhP/ha/season) of Pioneer corn variety at various climatic variabilities during wet and dry season

Season/Climate	Good	Neutral	Poor
Wet	31,378	26,903	26,704
Dry	29,067	29,626	28,958

Neutral (neutral year) scenarios. The amount of rainfall is an important variable that greatly influences corn production. In view of this, having an accurate forecast is potentially of value to the farmers inasmuch as it could help them decide whether to grow their corn now or to delay it for the next cropping opportunity. Meanwhile, the simulated long-term corn yields generated from the DSSAT were then used to calculate farmers' income. Income was calculated by multiplying the simulated corn yield by the price of corn, a variable gathered from the responses during the interview process.

For the study, with the use of weather data from Tuguegarao, corn yield was simulated using DSSAT for the period 1950 to 2006. The crop parameters used were within the observed values reported in the survey, implying that crop growth and development were simulated realistically. Hence, the simulation provides confidence that the DSSAT is able to capture the sensitivity of corn productivity to climate over a long time series.

To be able to evaluate the monetary value of SCF information, the expected gross margin of each Pioneer corn variety was calculated at various climatic conditions (Table 1). Corn is very susceptible to climate variations due to the plant's requirement for water for cell elongation and its inability to delay vegetative growth. Therefore, there is always the danger of yield loss regardless of the timing of planting. The amount of yield loss that occurs during climate variations depends on what growth stage the corn is in and how severe the climate conditions may become. Highest yields will be obtained only where environmental conditions are favorable at all stages of growth.

Based on the results, it was found that during the wet season, the good years (La Niña) yielded PhP31,378/ha on average; more than the yield for neutral years at PhP26,903/ha. On the other hand, the neutral years yielded more (PhP29,626/ha) than the good years (PhP29,067/ha) during the dry season. Hence, the Pioneer variety is estimated to have higher gross margin during the dry season across different climatic variabilities.

The value of SCF information can be computed as the difference between the gross margins of those *with* and *without* SCF scenarios. Chances of farmers who were not using SCF to attain higher gross margin might be lower than those who were using the forecast. Such value difference calculated was found to be PhP221/ha/season. While this figure could be considered very marginal for the individual subsistence farmers whose landholdings average only about 3.56 hectares, translating this amount to the total land area planted to corn in the Philippines (2.6 million hectares as of 2007) would, however, redound to a substantial amount and thereupon be of

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In Cebu: use of SCF gives higher income to corn farmers

Recently, a survey conducted by the Visayas State University in connection with the ACIAR-funded project "Bridging the gap between seasonal climate forecasts (SCFs) and decisionmakers in agriculture" shows that almost all of the SCF-user respondents considered climate in their production decisions. In fact, they considered SCF as having a medium to high significance in terms of value or contribution to their farm-

ing enterprise. The main reason cited by farmers is that climate plays a major role in corn production.

The study also indicates that both users and nonusers of SCF received adequate information about weather/climate. However, a higher proportion of SCF-user respondents reported receiving more accurate information about climate.

Using SCF innovation in corn production has indeed provided monetary benefits to corn farmers in Cebu. The study shows that the mean gross margin during the first season for SCF users was about PhP4,290/ha. This is comparatively higher than the mean gross margin of nonusers of SCF (PhP3,080/ha). Computed as the difference of gross margin between users and nonusers of SCF, the economic value of using SCF was found to be PhP1,210/ha. For the second cropping, the mean gross margin obtained by SCF users was about PhP7,867/ha while nonusers of SCF realized only PhP3,080/ha, which indicates that the economic value of using SCF in corn production decision is about PhP4,787/ha. Findings of this study imply that there is economic incentive for farmers to use farming innovation such as SCF in corn production. ✪ *EM/CDP*

Evolution of La Niña

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particularly felt in the Visayas area and some areas in Mindanao as manifested by the rainfall conditions during the event.

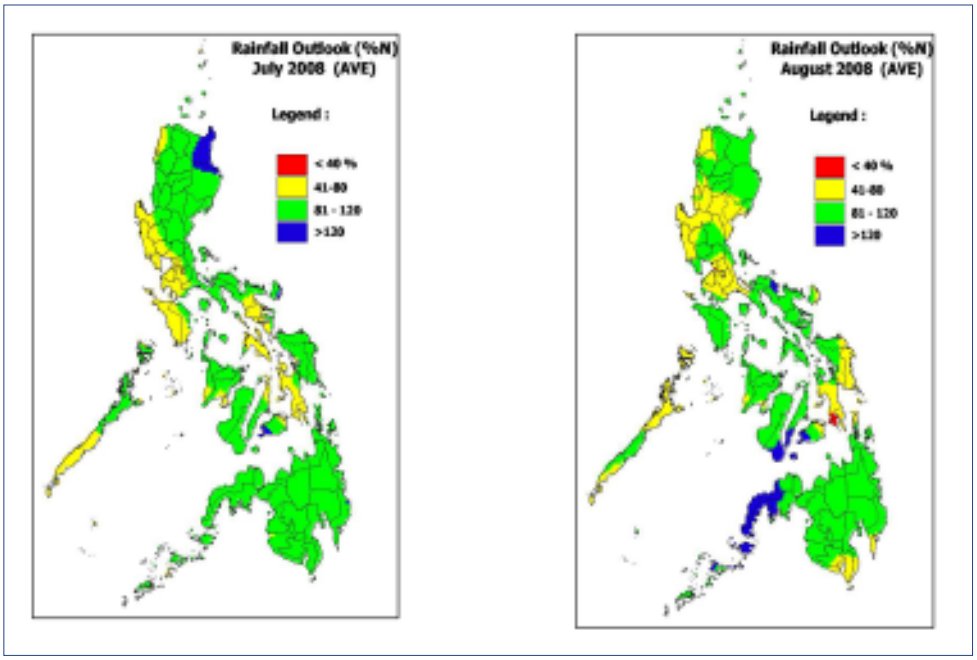
What to expect in the next two months

For July 2008, the western part of Luzon, except the Ilocos region, will likely experience below normal rainfall condition. Ditto with the southern part of Bicol, provinces of Leyte, Masbate, and northern Cebu. Meanwhile, above normal rainfall is expected over Cagayan Valley, as the rest of the country will likely receive near normal rainfall.

The August forecast seems to veer toward near normal to below normal rainfall conditions over Luzon, including most parts of Eastern Visayas. For Central and Western Visayas as well as most parts of Mindanao, the likely scenario will be near normal rainfall condition. Western Mindanao, however, is expected to have the opposite condition as above normal rainfall condition is forecast to prevail there in August.

Figure 1 shows the rainfall outlook for the country for the months of July and August 2008. ✪ *DFO/JPTL*

Figure 1. Rainfall outlook, July–August 2008



SCF is popular in Bukidnon but...

Gian Carlo Borines, Rotacio Gravoso, Jude Nonie Sales, and Ulderico Alviola

Yes, seasonal climate forecast (SCF) is popular among corn farmers in Bukidnon. This is according to a recent study on "Corn farmers' decisionmaking based on probabilistic climate forecast" conducted by a team of researchers from the Visayas State University (VSU) based on the results of focus group discussions among farmers from selected sites in the province of Bukidnon in Mindanao. The study found that farmers are aware of SCF, their sources of which included television, radio, and the PAGASA station in Malaybalay City. At the same time, it was learned that PAGASA and the City Agriculture Office often hold seminars and workshops on the SCF.

Notwithstanding this, however, "farmers depend more on their indigenous climate forecasting than on SCF," the study reported. For one, the study found that farmers think of climate forecasts as deterministic rather than probabilistic [please see explanation of probabilistic nature of SCFs in *SCF Project Updates* March 2008, page 2]. Thereupon, if the forecasts given do not jibe with what climatic condition actually takes place, then farmers tend to lose confidence in the forecasts. They also said that climate forecasts are hard to understand. Thus, they suggested that said forecasts use simple words and be downscaled to their locality.

The decisionmaking exercises utilizing hypothetical forecasts showed that under unfavorable climate forecasts, farmers would apply coping mechanisms like growing short-season crops, backyard gardening, raising animals, and finding a job in sugarcane plantations and industries in Malaybalay City. Generally, farmers' decisions were aimed to maximize profits and minimize cost. ✪

SCFs in monetary terms

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great significance for Philippine agriculture. Because of this, it would be of critical importance for decisionmakers/policymakers in agriculture to greatly improve the access of farmers to SCF information as well as to make such information affordable and efficiently available to corn farmers. ✪ *KGG*

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Apart from this newsletter and papers released occasionally, information and updates about the project, its research and research-related activities may be accessed through the project website at http://dirp3.pids.gov.ph/ACIAR.

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