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Headline: Growing rice, growing price: Is climate-smart tech the solution?

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PHOTO BY RAINIELLE KYLE GUISON

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LOS BAÑOS, LAGUNA—Inside the University of the Philippines Los Baños (UPLB), one can have an affordable yet filling meal at Tita Ding's Canteen. For just P25, students can have a cup of rice (P10) with half a serving of any vegetable dish.

Even after rice inflation in 2023 soared to 8.7% in August and peaked to 17.9% in September, the eatery kept its prices the same.

“Yung owner po ng karinderya..., sabi po ay kahit tumaas ‘yung presyo ng bigas, ganun pa rin ‘yung [presyo] ng kanin namin... Siya mismo ang nagsabi, priority niya talaga ‘yung mga bata kasi alam niyang naka-budget lang ‘yung mga estudyante,” said Mera Balila, a server at Tita Ding's Canteen.

(The eatery owner instructed us to maintain the price of rice despite the recent price hike. He himself said that the priority is the students since he knows that they are on a budget.)

But not all eateries can keep their prices down.

Just beside Tita Ding's Canteen is Annie's Lutong Bahay, which sells a cup of rice for P12 and half a cup for P7.

When the government temporarily set a price ceiling for rice in September, President Ferdinand Marcos Jr. cited hoarding, the Russia-Ukraine conflict, and India's rice export ban as factors that drove rice inflation.

After the price cap was lifted, rice prices remained high—15.8% higher in November 2023 compared to the same month in 2022.

But hoarding and global conflicts beyond the Philippines' control are not the only inflation drivers. Other

long-term threats, including climate change, are linked to the escalation of prices.

As a staple meal of Filipinos, rice is key to food security and increases in its price may contribute to food insecurity.

This prompted the government to look at several solutions, including integrating science and technology, to ramp up rice production and cushion inflationary impacts.

Among these is the increased use of satellite imaging and crop growth models. Two programs that already use these are the Philippine Rice Information System (PRiSM) and Project SARAI (Smarter Approaches to Reinvigorate Agriculture as an Industry in the Philippines).

Employing satellite imagery in agriculture is not new and has been around since 1972. But it was only in 2014 that PRiSM started operations and became the first satellite-based rice monitoring system in Southeast Asia.

The base technology used in satellites is called remote sensing, according to Arlo Sabuito, Science Research Specialist of the Philippine Space Agency. The satellite's sensors can collect data that tell scientists the crop characteristics, enabling them to study hectares of farms even from afar quickly.

PRiSM has four data products: rice area and planting dates estimates, rice yield and production estimation, assessment of rice areas affected by flood or drought, and field monitoring.

Experts derive these sets of information from open-source data collected by the European Space Agency's Sentinel 1A satellite. The maps produced by PRiSM have a 95% accuracy made possible by combining satellite images with Geographic Information System and on-ground validation by their partners.

PRiSM offers coverage from the national to municipal level and is available to the public through its website.

But PRiSM Unit Head Jovino De Dios said in an interview that the system's data products are not meant to increase rice yield. While farmers can use their planting calendars, PRiSM's products are more useful for policymakers.

"Kaya kung titingnan mo, hindi farmer ang rektang tinatarget ng PRiSM. Pero ang impact nito, umaabot sa farmer, kasi nakakagawa ng tamang desisyon yung policymakers, at yung mga tao sa gobyerno na tumutulong din sa farmers," he said.

(If you look at it, PRiSM does not directly target its services to farmers. But its impact reaches farmers because policymakers can make the right decisions, and government workers who also help farmers.)

He also noted that intermediaries are needed to interpret PRiSM's outputs for farmers to use them.

On the other hand, SARAI takes pride in the level of community involvement in their programs.

Like PRiSM, SARAI also provides farm maps, planting calendars, and flood and drought assessments. Additionally, they conduct workshops for Municipal Agriculture Offices (MAOs), teaching personnel how to map farmlands in their areas using QGIS, a free software for visualizing geospatial information.

RICE MONITORING REPORT. Dumangas MAO has been able to produce its own rice monitoring reports after being trained by SARAI. Their reports were produced in both English and Ilonggo.
PHOTO FROM DUMANGAS MAO FB PAGE

These functions enable MAOs to produce monitoring reports that allow farmers to check on their crops quickly.

With global temperatures rapidly increasing, the effects of climate change on agriculture have become more unpredictable.

"It is said that in Mindanao, they now experience typhoons in periods where they usually don't get these. Then there are also other areas that have reported longer drought periods," said Moises Dorado, project leader of SARAI Enhanced Agriculture Monitoring System (SEAMS), partly in Filipino.

EASILY UNDERSTANDABLE. SARAI translates technical data into easily understandable information for MAO personnel. This visual aid shows the health status of a plant according to the Normalized Difference Vegetation Index (NDVI). GRAPHIC FROM PROJECT SARAI.

Dorado, who is also a professor at the UPLB Institute of Agricultural and Biosystems Engineering, said that satellite technology enables farmers to address problems with their crops promptly

"If the area is flooded, you can introduce intervention if it can be drained or what," he said, adding that farmers can be proactive to avoid crop loss and still maximize their harvests.

Eugenio Decastillo Jr., the municipal agriculturist of Dumangas in Iloilo, said SARAI projects have helped them prepare weather advisories specific for farmers in the town.

On top of this, they have also utilized SARAI's mobile applications to monitor pest and disease and crop growth stages and development.

SARAI collects data from open source inputs from satellites such as Sentinel 1A and 2 and Landsat 8 through Google Earth Engine. Collecting data from multiple satellites has made crop monitoring possible as often as every three to five days.

In a recently funded project headed by Dorado, SARAI will implement integrated crop monitoring and forecast for rice and corn in selected LGUs. For rice, they will collaborate with farmers from Dumangas and Lupao in Nueva Ecija.

PRiSM and SARAI generate near-real-time data that are useful for policymakers, farmers, and MAO personnel. However, satellite technology still has its limitations.

For PRiSM, De Dios said they still face challenges in detecting upland rice areas with satellite remote sensing. They also encounter difficulties in delineating rainfed from irrigated agriculture and distinguishing direct-seeded from transplanted crops.

To move forward, PRiSM has submitted research proposals for funding, but these have not yet been approved.

SARAI's main concern is funding constraints, hence the limited number of areas they have involved in their projects.

Dorado also pointed out that the country has very few weather stations in agricultural areas, which would be helpful in observing changing weather patterns.

"You can't have it all eh. Kapag may tinaasan kang specification, may kailangan kang babaan dahil sa limitation ng technology or ng budget," Sabuito said, explaining that satellite data with high resolution has expensive subscriptions that could run to thousands or millions of pesos.

(You can't have it all. If you upgrade a specification, you need to balance it by downgrading another because of limitations in technology or budget.)

However, there is hope that recent government pronouncements on the importance of science and technology in agriculture would pave the way for more support.

The potential of climate-smart technology does not end with monitoring agriculture and empowering local farmers. In August, the National Economic and Development Authority (NEDA) started efforts to explore programs that use remote sensing in agriculture, including both PRiSM and SARAI.

BUILDING PARTNERSHIPS. NEDA has conducted site visits and meetings involving programs that use remote sensing in agriculture. PHOTOS FROM NEDA FB PAGE

De Dios said the information PRiSM produces is expected to be useful in mapping the inflation rate of rice and other agricultural products. This can help NEDA in predicting inflation trends in the future and formulating inflation policy advice.

“By giving advanced and more accurate information, the farmers, the policymakers, or the development workers can plan ahead in the right way,” he said.

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