

The power of weather data

Local climate information
could help predict natural
disasters and help farmers
adapt to climate change

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"There is an imbalance in terms of global weather forecasting. Many communities, such as those in the Cordillera, do not have access to high resolution weather data."

Dr. Yves Plancherel, Associate Professor in Climate Change and Environment, Imperial College London



The Challenge

- The Cordillera region in the Philippines is vital for food security in the country, but its weather is highly variable.
- The majority of the region's 1.8 million inhabitants depend on agriculture for their livelihoods and have limited access to empirical weather data. They are also highly exposed to natural hazards such as heavy rainfall and landslides.
- Improved weather data collection could bolster forecasting and help farmers and the government prepare for sudden weather changes, while also supporting a shift toward more science-based approaches to farming.

The Context

The Cordillera administrative region in the Philippines is a scientifically important but data-sparse climate zone. The mountainous area is home to 1.8 million inhabitants¹, most of whom engage in farming and small-scale food production².

The region is vital for food security in the Philippines. Most food in the country is produced at sea level, but the Cordillera's high elevations provide cooler, more temperate conditions that can support a wider variety of produce. However, farming in these areas is challenging: weather conditions are highly variable, the terrain is steep, and the region is prone to extreme weather events such as typhoons

There are not many weather stations in the Cordillera and the lack of observational data limits local forecasting. Satellite imaging is available, but does not provide validated weather data, such as the amount of water that precipitated in a specific place. It is also difficult for local authorities to access.

Because of the terrain, weather can vary significantly between locations in the Cordillera⁴. For example, opposite sides of the same mountain can experience very different rainfall. This makes forecasting, climate analysis, and hazard assessment difficult.

"Localisation is important for policy making. The data is important for us to shape what can be improved, it provides evidence."

Jazzie Jao, Research Associate, De La Salle University, Philippines

"Installing weather stations is very important to see if our models are able to predict the actual weather on the ground. We are collaborating with local scientists and universities to see if the new weather data can help them make more accurate forecasts."

Jejomar Bulan, Graduate Student, De La Salle



Method

- Researchers from Imperial College London partnered with academics and local stakeholders in the Philippines, such as the researchers from De La Salle University, to improve local weather forecasting through instrumentation and partnerships.
- Imperial provided 18 automatic weather stations, funded by the UK Research and Innovation's International Science Partnership Fund. These stations have been installed at sites throughout the Cordillera and the project has funding to collect data for three years.
- The stations are in different locations and placed at different altitudes. This will help researchers understand how weather changes with height.
- The team worked with local stakeholder groups and individuals to identify the best locations to erect the weather stations. Many have been installed in schools, where teachers and students use the data as part of their class work.

Benefits

- **Enhanced decision making:** The data from the stations will be used to model local weather and forecast the risks of natural disasters, such as flooding and heavy rainfall. The data can also inform agricultural decision making, such crop choices and planting cycles.
- **Data access:** Project partners are engaging with local authorities and universities to make the weather data widely available.
- **Technology localisation:** The team is working with local stakeholders to develop locally relevant technologies and solutions that make use of the data.
- **Skills development:** Local universities can access the data to train students in climate science and how to develop models for their local environment.
- **Sustainability:** By engaging with local stakeholders, the project ensures that the technological outputs address real-world problems and that there is local buy-in for the project.

"The Cordillera region produces about a third of the Philippines' food. It's important to help farmers adapt to climate change."

Prof. Edgar Vallar, Department of Physics, De La Salle University, Philippines

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For more information

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Impact

- **For farmers:** The weather station data can support farmer decision making. The data can point to optimised planting cycles; warn them about impending natural hazards, such as flooding; and inform which crops to plant.
- **For communities:** Natural disasters are a constant threat in this mountainous region. Improved forecasting can help individuals and communities better prepare for hazards and evaluate risk. Data-supported agriculture can also bolster food security, which benefits communities in remote areas.
- **For governments:** Data helps the government and local authorities make better decisions. The information from the weather stations can, for example, tell authorities when they need to close schools or evacuate communities because of bad weather or a potential natural hazard. The forecasting models can also identify climate trends and help the government plan for and adapt to climate change.

Notes

1. Philippine Statistics Authority, 'Highlights of Cordillera Administrative Region Population 2024 Census of Population', accessed July 2026. <https://psa.gov.ph/content/highlights-cordillera-administrative-region-population-2024-census-population-2024-popcen>
2. Republic of the Philippines Cooperative Development Authority, 'Profile of the Region', Accessed July 2026. <https://cda.gov.ph/region-car/about/>
3. Philippine Statistics Authority, 'Crop Production Survey 2024-25' Accessed July 2026. <https://rssocar.psa.gov.ph/content/cy-2024-cordillera-vegetables-situationer>
4. Racoma, B.A.B et al. 'The effect of the Cordillera mountain range on tropical cyclone rainfall in the Northern Philippines', Atmosphere, Vol. 14., 2023.

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