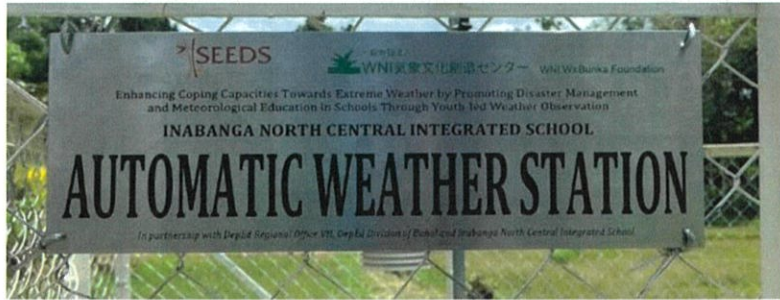


Project Completion Report



Project:

Enhancing Coping Capacities Towards Extreme Weather by Promoting Disaster Management and Meteorological Education in Schools through Youth-led Weather Observation

(若者主導の気象観測を通じた防災と気象教育の促進による異常気象への対処能力向上事業)

Implementation period: July 2024 – June 2025

Implementing organization:

SEEDS Asia with Technical support from Prof. Yusuke Yamane

Target school: Inabanga North Central Integrated School (INCIS), Bohol, Philippines

Supported by: WNI Bunka Foundation

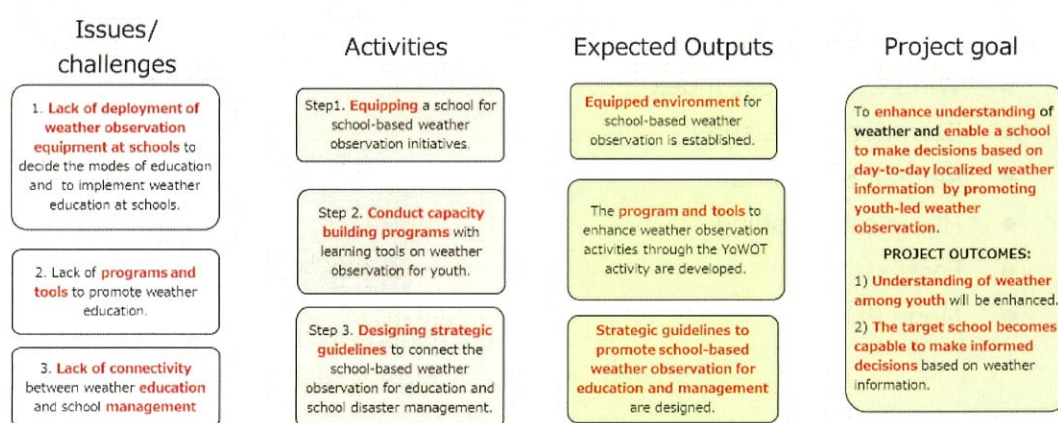
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youth-led weather observation can empower schools to make timely, evidence-based decisions and serve as a replicable model for strengthening climate resilience in the education sector of the Philippines.

- Strategic guidelines formulated to integrate weather observation into both education and school disaster management practices.

As a milestone for the two overarching outcomes, the overall project goal was defined as “To enhance understanding of weather and enable a school to make informed decisions based on day-to-day localized weather information by promoting youth-led weather observation.”



2. Activities and Outputs

Activity 1 : Equipping a school for school-based weather observation initiatives

1-1: Selection of the site for installation and procurement of the AWS

The Vantage Pro2 was selected as the observation equipment due to its proven reliability and durability in tropical climates, as well as its ability to measure a comprehensive range of meteorological parameters such as temperature, humidity, air pressure, wind speed and direction, and rainfall. Importantly, a local distributor is available to provide maintenance and repair services in case of malfunction, and training sessions on equipment use were conducted for



Figure 2: AWS installation and training session on equipment operation and maintenance

Outputs of Activity 1

Output 1: Equipped environment for school-based weather observation is established.

- ☑ An Automatic Weather Station (AWS) was installed at the Model School after consensus was reached among stakeholders on the selection of the AWS model and its site.
- ☑ The station has operated since July 10 at the school. The AWS provides continuous measurement of key meteorological parameters and was secured with protective fencing to ensure safe operation and sustainability.
- ☑ All registered users to access real-time meteorological data via a mobile application or console panel, allowing both students and school management to monitor local weather conditions at any time. This arrangement has enhanced YoWOT' s engagement in practical meteorology and fostered ownership in maintaining the system.

Activity 2: Conduct capacity building programs with learning tools on weather observation for youth

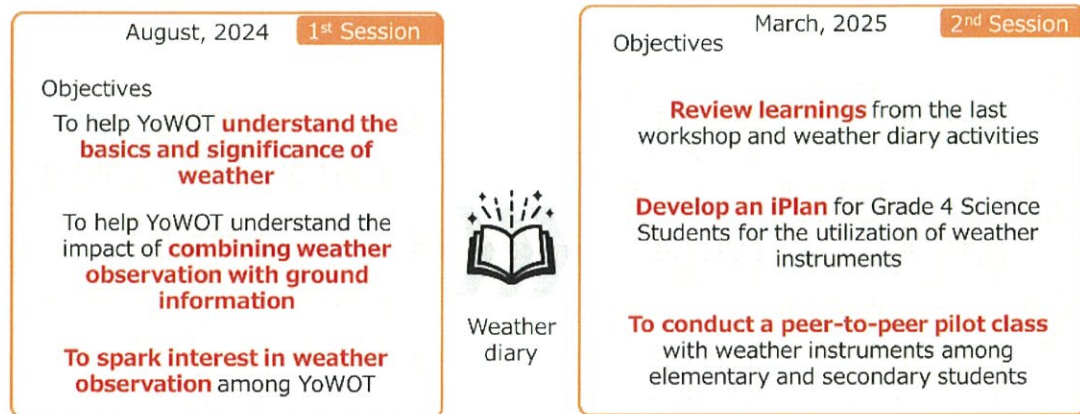


Figure 4: Summary of Session 1 and Session 2 of the capacity-building program

2-1: Development of learning tools along with capacity building program for youth

Learning tools such as PowerPoint slides, weather diaries, and simple observation instruments were developed, alongside a structured capacity-building program for the Youth Weather Observation Team (YoWOT).

The objectives were to

- (i) help students understand the basics and significance of weather,
- (ii) illustrate the importance of combining observation data with ground-level information, and
- (iii) spark interest and sustained engagement in weather observation.

② Understanding Unique Impacts through Sky and Ground Information by SEEDS Asia

Objective:

- To help participants understand the impact of combining weather observation with ground information
- To deepen understanding of real community issues related to weather

Content: School/Town Watching (Day 1-Day 2)

- Visualizing weather impacts around the school
- Mapping and visualizing past meteorological disasters and current conditions
- Dividing into teams: Heatwave Team and Rain Team
- Mapping exercise and deciding the observation point: Marking areas within the school and surrounding areas that are prone to flooding or lack shade
- Conducting interviews with local residents to gather information
Examples: Areas that flood even with a small amount of rain → Issues with clogged drains
Heatwave issues: Lack of wind, lack of shade, high reflective heat areas

③ Introduction of Weather Diary by Prof. Yusuke Yamane

Objective:

- To encourage participants to develop a habit of daily weather from PAGASA and ground information recording with their ownership
- To equip participants with skills to autonomously collect and analyze data for local disaster preparedness

Content:

- Understanding the benefits of collecting weather and ground information
- Developing a "Weather Diary" notebook for tracking weather observations and local impacts
- Using the diary to understand evacuation triggers

fostered consistency in record-keeping but also encouraged real-time sharing and collective learning. By comparing locally observed data with official PAGASA announcements, students identified discrepancies, thereby deepening their understanding of localized weather impacts. This activity also enhanced their critical thinking skills and promoted awareness of climate change in a locally relevant way.

In addition to including photographs and personal reflections in their diary, SEEDS Asia created a Messenger group through which they shared their entries and observations with the entire team in real time.

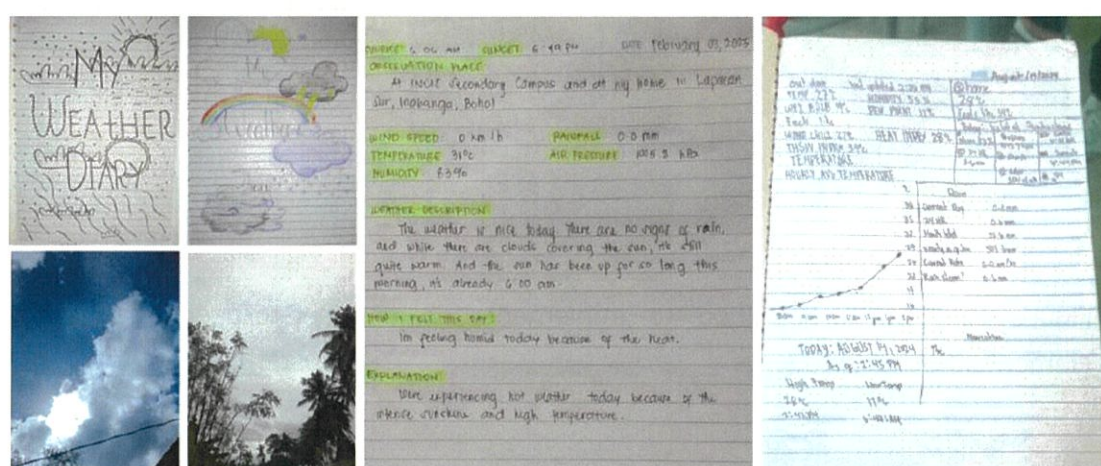


Figure 7: Examples of weather diary entries by YoWOT members

2-4: Conduct of YoWOT Training to Grade 4 students

To consolidate their learning, SEEDS Asia, in collaboration with Professor Yusuke Yamane of Tokoha University, facilitated a two-day special meteorology class for high school students at Inabanga North Central Integrated School.

Day 1 (March 10): High school students reviewed the contents of the 2024 workshop and their Weather Diaries, reflecting on lessons learned about air, clouds, rainfall, and extreme heat. Building on these, they developed lesson plans to teach meteorology to elementary school students, thereby reinforcing their own understanding through the process of lesson design.

Day 2 (March 11): High school students delivered their peer-designed lessons to elementary learners. To make the sessions engaging and interactive, they used songs and dances, demonstrated meteorological instruments such as thermometers,

improvements in meteorological understanding and engagement.

- ☑ Existence of accumulated meteorological records post-installation and records of their impact on the school and surrounding areas by YoWOT (high school students).

YoWOT accumulated 354 cases of weather diaries recording meteorological data alongside personal reflections and photographs, and shared observations via a Messenger group (Note: While no compiled dataset was produced comparing PAGASA announcements and school-based observations, the individual diary records serve as primary evidence of localized observation and reflection). Furthermore, YoWOT members identified specific sites vulnerable to extreme heat and flooding through town-watching program.

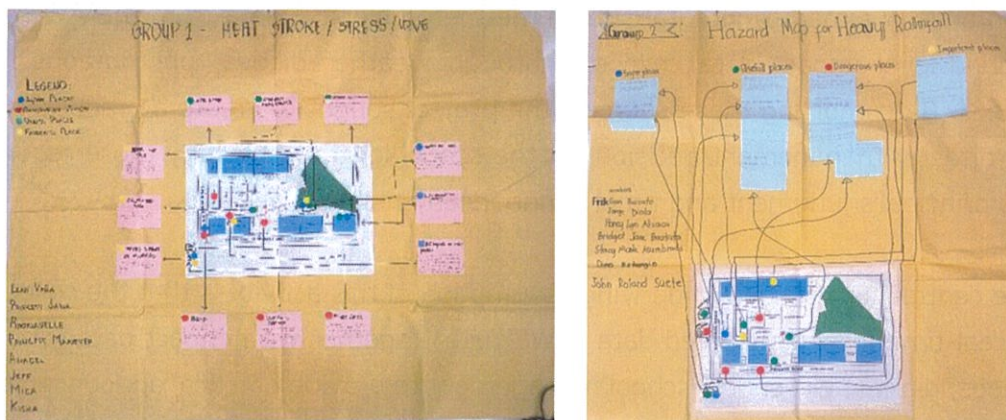


Figure 9: Flood- and heat-prone areas identified through town watching activities

- ☑ All Grade 4 Students at the Target School Received Class by YoWOT
- High school YoWOT members made instruction plan with the support of science teacher and delivered meteorology lessons to all Grade 4 students, using interactive teaching methods and real meteorological instruments. Feedback statements from high school students were also recorded (e.g., “I feel more confident talking about meteorology”).



Figure 10: Summary of the outputs generated under Activity 2

This discrepancy underscores the limitations of relying solely on distant observation stations. While PAGASA advisories remain essential, it is equally important for schools to recognize the value of on-site observation. Depending only on official announcements may delay timely protective action, making it difficult to ensure the immediate safety of children.

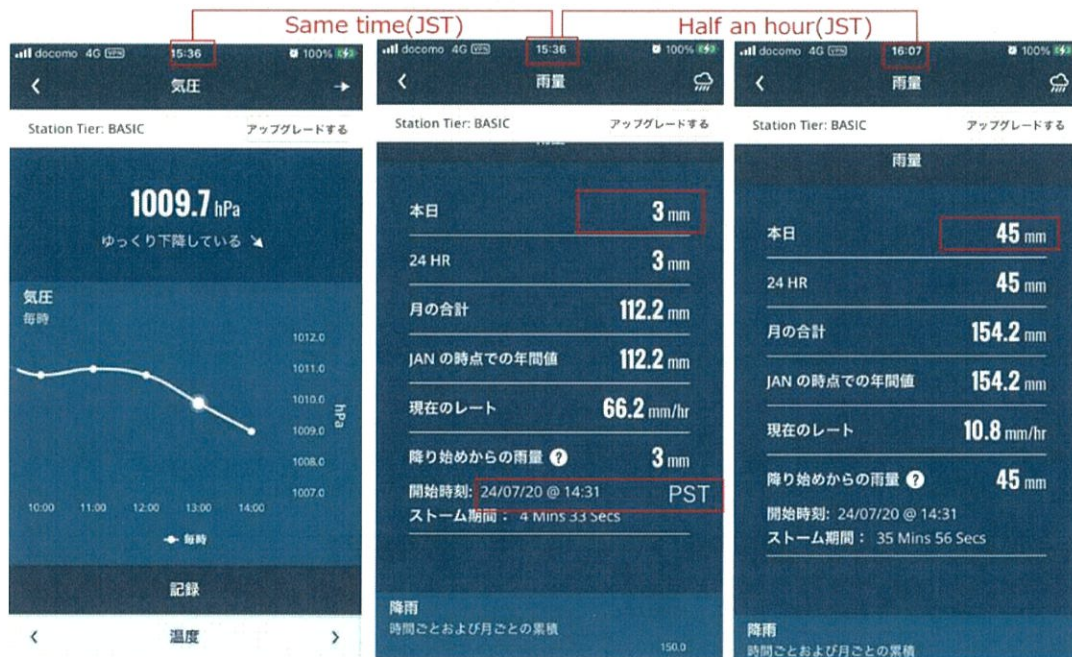


Figure 11: Mobile application display of observation data recorded during the heavy rainfall event on July 20, 2024



Figure 13: Condition of the Elementary school grounds, recorded at PST 14:35 (JST 15:35)



Figure 14: Condition of the Elementary school grounds, recorded at PST 14:53 (JST 15:53)

The Model School case provided concrete evidence of the effectiveness and good practices of youth-led weather observation. The exchange with education authorities underscored the potential of these approaches to elevate the priority of weather education within both school curricula and management systems, thereby strengthening the integration of education and disaster risk reduction (DRR) in the sector.



Figure 16: Principal of the Model School presenting project activities and impacts to officials of the Department of Education Region VII and district disaster risk reduction coordinators

3-3: Establishment of School-based Weather Observation Awards

To ensure that the achievements of this project are sustained and scaled beyond the Model School, SEEDS Asia prepared and presented a proposal to DepEd Region VII for the establishment of a School-Based Weather Observation Award System.

The proposed award scheme is designed to recognize schools that actively implement weather observation activities and to provide incentives that encourage the institutionalization of such practices. The initiative also seeks to encourage collaboration with PAGASA, which has shown strong commitment to nurturing

Outputs of Activity 3

Output 3: Strategic guidelines to promote school-based weather observation for education are designed.

- ☑ Records of sharing of analysis method and results for setting the Critical Line, requiring school-level decision-making based on observed data, by meteorological experts. A framework was developed to integrate real-time AWS data with ground-level impact records (weather diaries, photos, videos).

- ☑ The school head becomes able to make informed decisions or advisories to students during extreme weather, especially regarding heat.

For this, provisional “critical lines” for rainfall were established and as reference thresholds to support school heads in making timely and evidence-based announcements for disaster risk management (DRRM).

For heatstroke, while PAGASA uses a cross-table of humidity and temperature to determine the Heat Index, the project developed a more practical and user-friendly tool based on the Index. An Excel sheet was designed so that by simply entering the observed data from the AWS (temperature and humidity), the Heat Index is instantly calculated. The simplified digital solution made easy for the school head to decide the advisory to learners.

- ☑ Issuance and sharing of strategic guidelines as a case study with DepEd Regional Office VII for setting the Critical Line in schools using youth-led weather observation.

A conference was convened with DRR Coordinators from DepEd Region VII, during which the Model School case was presented as concrete evidence of youth-led weather observation and its application in disaster risk management. Based on the activities throughout the project and discussions at the conference, a case study for developing guidelines was documented and formally submitted to DepEd Region VII. This output marked a key step in promoting the institutionalization of weather education in schools and provided a foundation for DepEd Region VII to consider school-specific guidelines for decision-making using youth-led weather observation.

- ☑ Submission of recommendations for school-based weather observation Awards to DepEd Regional Office VII.

In addition to knowledge gains, the project assessed behavioral changes in how students would act upon noticing abnormal weather conditions.

- Before (February 2025 survey, n=13):

The most common response was to inform family and friends (69.2%). Around half of the students reported checking AWS data (53.8%) or getting more information from PAGASA (53.8%).

- After (March 2025 survey, n=14):

While informing family and friends remained high (57.1%), a major shift was observed in discussing situations with family (up to 78.6%) and in informing teachers/encouraging actions (14.3%, previously 0%). This reflects growing recognition of formal channels of action within the school.

These results demonstrate that participation in the program did not only improve meteorological knowledge but also broadened students' sense of responsibility and agency in responding to abnormal weather. The inclusion of teachers and structured communication channels in students' responses indicates a positive behavioral shift toward collective disaster preparedness.

1) Understanding of weather among youth was enhanced + behavioral change

February 2025 : Before 2nd Session (n=13)

March 2025: After 2nd Session(n=14)

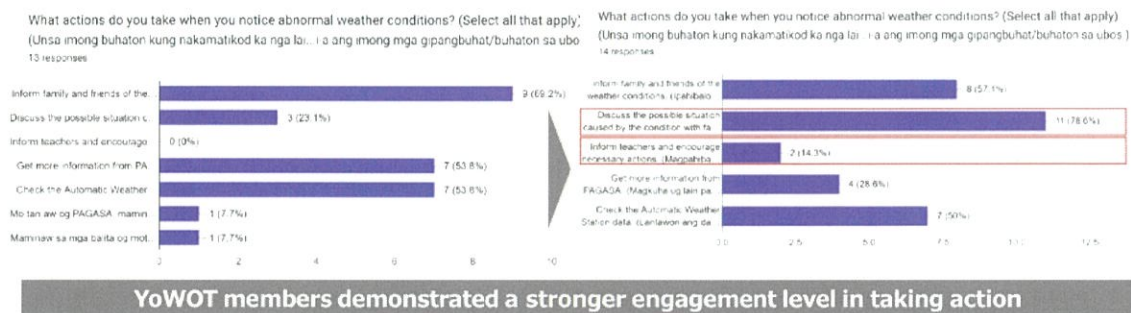
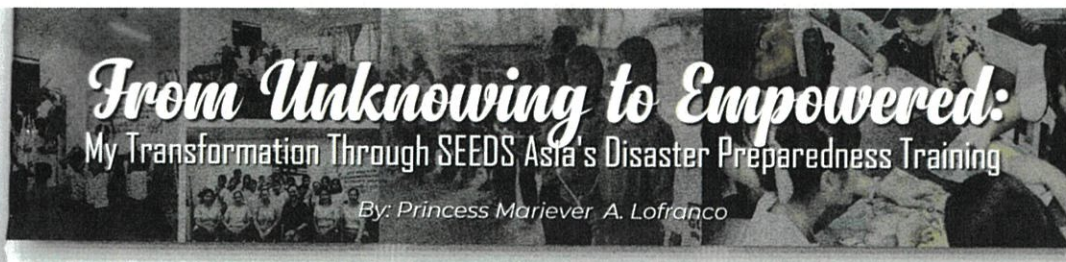


Figure 19 Data illustrating behavioral change among YoWOT team: When asked how they would respond upon receiving information about an approaching typhoon, students reported notable changes in behavior, including consulting with family members on potential impacts and appropriate responses.



Our training with the SEEDS Asia team was a pivotal experience that fundamentally shifted my understanding of weather-related risks and our community's ability to respond. Before this, many of us students and teachers were largely unaware of the practical tools and effective strategies for weather monitoring and disaster response. However, the SEEDS Asia experts expertly guided us through a series of eye-opening and deeply engaging hands-on activities that effectively bridged this critical knowledge gap.

The learning was profoundly experiential, moving far beyond theoretical concepts. We weren't just told about weather risks; we actively became investigators of our local environment. The installation and demonstration of weather instruments, like the rain gauge, demystified what once seemed like complex technology, making the process of data collection accessible and understandable. As a student, I received direct, hands-on training in recording and critically analyzing this data. Setting up our own weather station within the school grounds was particularly empowering. Suddenly, we had the ability to track our own local weather patterns, fostering a real sense of ownership over our preparedness efforts. This practical engagement transformed abstract concepts into tangible realities, sparking my curiosity and instilling a much deeper appreciation for the vital science behind weather forecasting.

Beyond simply collecting data, the disaster preparedness drills were incredibly impactful in shaping my understanding of emergency response. Participating in realistic simulated earthquake and fire evacuations, complete with clear safety protocols, ingrained in me the critical importance of swift and coordinated action in moments of crisis. The flood response simulations were particularly relevant and resonated deeply within our coastal community of Inabanga. I learned firsthand how to identify safe zones, locate emergency exits efficiently, and understand the crucial, step-by-step actions to take during a flooding event – knowledge that could be life-saving. I personally witnessed fellow students, including myself, taking initiative during these drills, stepping into leadership roles to guide our peers. This experience not only skyrocketed my confidence in my ability to act in an emergency but also significantly honed my communication and teamwork abilities under pressure.

The training also illuminated the crucial broader context of climate change in a way that truly resonated with me. Interactive workshops clearly demonstrated the direct link between climate change and the increasing intensification of weather patterns and natural disasters – something I now understand is directly impacting our community. Participating in practical activities promoting sustainable practices, such as the school-wide tree planting initiatives and engaging discussions on effective waste management strategies, sparked a genuine sense of responsibility within me and many other students. This newfound awareness inspired me to brainstorm and even initiate small eco-friendly projects within our school community, feeling empowered to make a tangible difference.

By the conclusion of the SEEDS Asia training, a remarkable and undeniable shift had occurred within me and my peers. We students, along with our teachers, had gained essential, practical skills in weather awareness, emergency preparedness, and overall disaster resilience. I personally felt a newfound and significant surge of confidence in my ability to understand and respond effectively to extreme weather events. This training has undoubtedly contributed to a safer and more prepared school environment, and I feel equipped to extend this positive impact to my family and the wider community of Inabanga. The knowledge and skills imparted by SEEDS Asia have empowered me to move from a position of feeling vulnerable and uncertain to one of proactive preparedness and a sense of responsibility for our collective future.

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Figure 20: Student reflections: Articles contributed by YoWOT members and published in The Record, a school newsletter issued on the third anniversary of Typhoon Odette (December 2024, Vol. 1, Issue 1).

The comparison of test results indicated that students who maintained their weather

combined with peer-led explanations, led to substantial improvements in students' understanding, particularly in relation to the thermometer, where more than half of the learners answered correctly after the lesson.

The findings reinforce that peer-to-peer methodologies are effective in transferring meteorological knowledge to younger learners, complementing classroom instruction and strengthening overall disaster risk reduction education.

2. Improved school capacity to make informed decisions based on localized weather information

The installation of the AWS and the maintenance of weather diaries provided the school with actionable data for decision-making. Based on these inputs, provisional critical lines were developed for rainfall and heat to guide protective actions in the model school.

In addition to collecting and analyzing meteorological data, the school began to utilize student-led weather observations for daily communication and risk management. YoWOT members regularly posted observation records and advisories on the school bulletin board, making weather information visible and accessible to all.

Examples included practical safety messages such as: "Sudden rain is expected, so do not forget to bring an umbrella" or "based on the heat index, drink water to avoid dehydration"

This practice demonstrates how localized weather data, interpreted by students, can be transformed into school-level advisories that directly support the safety and preparedness of the entire school community. The visible presence of such advisories also indicates that the school head and teachers are increasingly relying on localized observations in their risk management and day-to-day decision-making.

3. Community and Place Attachment

Although not initially set as a project outcome, SEEDS Asia places strong emphasis on fostering place attachment through all its activities. The weather observation

Key achievements include:

- One AWS installed at the Model School, fully operational and protected with fencing, providing real-time data accessible to any users via mobile application (Devis: Weatherlink).
- A structured learning package was developed, consisting of a 1.5-day training session, peer-to-peer learning sessions, weather diaries, and teaching materials, which affirmed its effectiveness in strengthening meteorological literacy among students. A total of 15 high school students (YoWOT members) received capacity-building training and produced 354 pages of weather diaries documenting local conditions and impacts. Following this, all 40 Grade 4 students at the Model School participated in weather observation classes facilitated by YoWOT members using training tools and observation instruments. This peer-to-peer learning approach did not only enhanced the understanding of Grade 4 learners but also further reinforced the meteorological knowledge and teaching confidence of the YoWOT members themselves.
- Engagement with education authorities: A conference was convened with 20 DRR Coordinators from DepEd Region VII, where draft guidelines for promoting weather education and decision-making based on local data were discussed and proposed recommendations for a School-based Weather Observation Award to DepEd Region VII to recognize schools adopting weather observation and management practices.
- Beyond its original objectives, the project also fostered a stronger sense of place attachment and community appreciation among participating students. Pre- and post-surveys revealed an increase in students who “strongly agree” that weather observation deepened their appreciation for their community, from 76.9% before to 92.9% after.

Overall, the project has laid the groundwork for scaling up school-based weather observation initiatives in the Philippines. The Model School now serves as a replicable case for integrating meteorological education and disaster risk reduction (DRR), with demonstrated educational, behavioral, and institutional impacts.

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