

Climate-Smart Technology Implementation-Smart Weather Station

Promoting climate-smart water technologies and innovations for sustainable water resources and rice production under climate change in the Lancang-Mekong Region

SEI Field Report May 2024 Satish Prasad





Climate-Smart Technology Implementation-Smart Weather Station in Nakhon Ratchasima

15th- 16th May 2024 Nakhon Ratchasima, Thailand







Installation of smart weather station in Nakhon Ratchasima

Nakhon Ratchasima emerges as a pivotal hub for climate-smart technologies, driven by alarming projections from the Intergovernmental Panel on Climate Change (IPCC) that designate the region as highly vulnerable to drought. Two pilot sites in Nakhon Ratchasima province were selected to recognize the vulnerability following a survey, discussions on the needs of farmer groups, and an assessment of current climate risks and irrigation challenges. This selection of the pilot sites involved discussions among experts from the Office of National Water Resources (ONWR), Rajamangala University of Technology Isan (RMUTI), and the Stockholm Environment Institute (SEI), also leading to the identification of climate-smart technologies that are well-suited to address the specific requirements of the region's farmers.



The project vision is to build climate-resilient water resources and rice farming systems in the Mekong-Lancang Region.

In a significant step towards implementing climate-smart technologies, the SEI organized a field visit and training workshop on May 15th and 16th, 2024. Intending to promote climate-smart technologies, SEI also invited participants from several research institutes and government agencies of Laos, including the National Agriculture and Forestry Research Institute of Laos, Department of Water Resources, Faculty of Environmental Sciences, National University of Laos, Department of Meteorology and Hydrology.

Objective

The primary objective of this visit was to install smart weather stations at pilot sites, provide training on its use to the farmers, and facilitate engagement with private partners.

Study area

The pilot sites were chosen to evaluate the effectiveness of implementing climate-smart technologies (a) Non Kra Sang village, Kra Bueang Yai Subdistrict, Phimai District, and (b) Sung Noen District. Sung Noen District has access to irrigation, while the Phimai District relies entirely on precipitation for its water supply. This approach allows for a comprehensive assessment of the technologies under varying water availability conditions. Implementing climate-smart technologies involved two steps: (a) before sowing the crop and (b) after the crop is sown.

About smart weather station

Selecting a weather station with advanced capabilities and comprehensive environmental monitoring features that align perfectly with the project's needs is necessary. The current study

used Smart Weather, Pollution, and Carbon Station "FAHFON SENSE" from CPS Agri Company Limited. Critical reasons for choosing this particular model:

- Comprehensive Environmental Monitoring: The FAHFON SENSE weather station can measure
 a wide range of environmental parameters, rainfall, temperature, relative humidity, wind
 speed and direction, barometric pressure, light intensity, UV Index, dust concentrations, and
 carbon dioxide levels in a compact wireless battery-operated device.
- High Precision and Accuracy: The weather station has high accuracy. For example, it can measure temperature with an accuracy better than ±0.65 °C in the range from 5°C to 50°C, has a measurement resolution better than 0.03 °C, and complies with RoHS and WEEE standards. Similarly, it can measure rainfall with an accuracy of 0.15 mm per 1 pour and measure humidity, wind speed, and direction detection, ensuring reliable and actionable data. Read more about the weather station here: https://www.fahfon.io/en/product/fahfon-sense-personal-sense-1-model/
- **Compact design and easy to install:** It has a compact, robust design and can be easily installed. It is solar and equipped with GPS for precise and smooth data transfer.
- **Real-Time Data and Ease of Use:** It provides real-time data through an integrated app, enabling farmers to make immediate and informed decisions. The app has a user-friendly interface, and after installation, detailed training is provided to the farmers, so they can effectively use data to optimize their farming practices.



Photo 1: Installation of FAHFON SENSE weather station

Training

During the visit, the expert from CPS Agri Company Limited gave an introductory session to the farmers, explaining the structure and working on FAHFON SENSE weather station. They provided a comprehensive overview of how the weather station operates, ensuring the farmers understood the technology's principles and benefits. The easy of understanding the application on weather station and little training needed was primary factors to choose this device. The experts made sure farmers had hands-on experience with the app by providing them complete training on how to use it. The purpose was to build their capacity to independently manage and understand data, enabling long-term sustainability of the project outcomes.



Photo 2: Experts training the farmers on how to use the FAHFON application to visualize information from the weather station

Among the many user-friendly functions of the FAHFON application are its detailed information on the temperature, humidity, rainfall, wind speed, atmospheric pressure, light intensity, UV Index, dust, and CO2 levels that the device collects and updates every half an hour. Moreover, it offers seven-day forecast tailored to the device location together with hourly weather updates. Easy-to-understand graphical visualization of the data allows it to be used to maximize crop planting, harvesting, and irrigation.

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Photo 3: Picture showing the wide range of information that can be visualized on the FAHFON application



Photo 4: Farmer sharing his experience on the training workshop and usability of weather station

Participation of Partners from Laos

As part of the initiative to promote climate-smart technologies in the region, SEI invited significant stakeholders from Laos to join the training workshop and field visit that took place in Nakhon Ratchasima. During the visit, participants from Laos were made part of the weather station installation process and were provided with comprehensive training on the operation of the weather station. SEI facilitated communication between representatives from Laos and leading private companies in Thailand, who are developing climate-smart technologies. This engagement was aimed to foster collaborations and promote the adoption of these technologies in Laos, enhancing the country's capacity to manage water resources and improve agricultural resilience against climate change.



Photo 5: Participants from Laos getting hands-on with humidity meter and smart weather station

Conclusion

The introduction of the FAHFON SENSE weather station to local farmers in Nakhon Ratchasima marked a significant step towards advancing climate-smart agricultural practices. The collaboration between SEI, the Office of National Water Resources (ONWR), and various

partners from Laos underscored the project's commitment to fostering regional cooperation and knowledge sharing.

Throughout the field visit, farmers and participants from Laos received hands-on training on the use of the weather station and its accompanying app, ensuring they could independently manage and interpret the data. The installation of weather stations at two pilot sites—one with irrigation access and the other relying on precipitation—allowed for a comprehensive assessment of the technology under different water availability conditions.

SEI extends its gratitude to CPS Agri Company Limited for their invaluable support and expertise during the field visit. Their contribution was instrumental in the successful demonstration and training sessions, and their partnership is greatly appreciated.

Overall, the collaborative efforts of SEI, ONWR, RMUTI, the participants from Laos, and CPS Agri Company Limited have laid a strong foundation for future initiatives aimed at enhancing the resilience of water resources and rice farming systems under changing climate conditions.



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