

# Modernization of Forecasting and Warning System for Natural Disaster in Vietnam



## Project Background

Vietnam is one of the most disaster-prone countries in Asia. The country often experiences various types of natural disasters such as tropical cyclones, floods, flash floods, heavy rains, drought, landslides, thunderstorms and whirlwind.

In particular, the northeast region of Viet Nam is affected by an average of 1-2 storms, 3-4 typhoons and tropical monsoon, directly and indirectly. Directly-affected storms usually occur in the period of July-September with a total frequency of 78%.

In general, hydro-meteorological forecasts in Vietnam have relied on traditional methods. The reliability of them were not high and the forecast range were narrow.

Warnings and forecasts of hazardous weather phenomena play a very important role in fighting and preventing the impacts from natural disasters, to reduce the loss of life and property of local people. Therefore, the investment in the project "Modernizing the Natural Disaster Warning and Forecasting System in the Northeast Meteorological Observatory" was essential.

## Project Objectives

The objective of this project is to enhance hydro-meteorological monitoring and forecasting capacity of the National Hydro-Meteorological Service and the Northeast Meteorological Observatory especially in responding to and mitigating damage caused by natural disasters, by modernizing the hydro-meteorological sector.

## Key Activities

- Investigating the meteorological status and the related infrastructure conditions of Viet Nam
- Conducting a field investigation on meteorological and hydrological station network in northeastern Vietnam

### Project Summary

**Duration:** 2014-2016 (3 years)

**Management Agency:**

Korea Meteorological Administration (KMA)

**Implementing Agency:**

Korea Meteorological Institute (KMI)

**Beneficiary Agency:**

Vietnam Meteorological and Hydrological Administration (VNMHA)

**Funding Source:** KMA

**Target Location:**

25 meteorological stations and 25 hydrological stations in Northeastern regions of Vietnam

**Project Budget:** 4 M USD

**Contact:**

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- Installing AWSs at 25 meteorological stations in northeastern Vietnam
- Installing automatic water level observation equipment at 25 hydrological stations in Northeastern Vietnam
- Installing power systems (solar cells and rechargeable batteries) at the observation stations
- Developing forecasting analysis display system
- Supporting the operation of the systems through training programs

Phu Lien, Mong Cai, Quang Ha, Tien Yen, Dinh Lap, Co To, Luc Ngan, Huu Lung, Mau Son, Bac Son, Bao Lac, Nguyen Binh, Cao Bang, Trung Khanh, That Khe, Lang Son, Thất Khê

- 25 hydrological stations: Cua Cam, Kien An, Binh Lieu, Cam Dan, Ben Trieu, Don Son, Lang Son, Huu Lung, Van Mich, Cao Bang, Bao Lac, Cau Son, Phuc Loc Phuong, Luc Nam, Ben Ho, Dap Cau, Phu Lang Thuong, Trung Trang, Tien Tien, Do Nghi, Dong Xuyen, Chu, Chanh chu, Cao Kenh, Quang Phuc

### Where We Work



The project sites were 25 weather stations, 25 automated hydrological stations in Northeastern Vietnam.

- 25 weather stations: Bac Ninh, Hiep Hoa, Bac Giang, Son Dong, Cua Ong, Bay Chay, Uong Bi, Hon Dau,

### Outputs

- Installed AWSs at 25 weather stations, automatic water level observation equipment at 25 hydrological stations, monitoring system and flood forecasting system
- Trained 32 staff from NHMS through capacity building programs
- High quality observation data collected from AWS system

### Outcomes

- Enhanced work efficiency through the installation of AWS
- Enhanced weather forecasting and disaster preparedness and response capacity of NHMS



▲ Invitational training



▲ Hand-over signing ceremony

*“Two years ago, the northeastern region of Vietnam used to observe weather manually. However, after the installation of Automatic Weather Stations (AWS) and automatic water level observation equipment through this project, Vietnam is able to reduce damage from natural disasters. NHMS will work hard to operate the system effectively and ensure the sustainability of the project. I would like to express my gratitude to the KMA and KMI.”*

- Dinh Thai Hung, head of international cooperation division, VNMHA -



# Automatic Weather Station (AWS)

## AWS



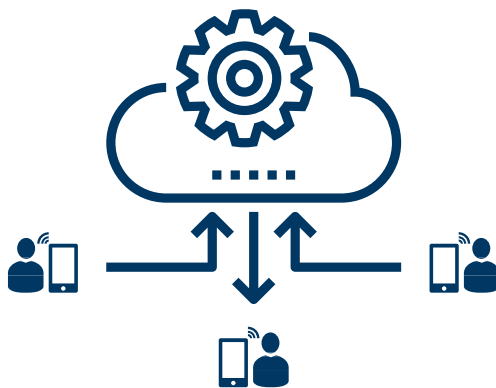
Observe weather every minute with AWS sensors (temperature, humidity, air pressure, wind direction/speed, precipitation, aspirator)

## Vietnam Meteorological and Hydrological Administration (VNMHA)



Transfer weather information to VNMHA in Vietnam

## People in Vietnam



Provide weather forecast to public through Media, SNS etc.

## Analysis / Display / Monitoring system

Alert Status	Temperature	Total Precipitation	Pressure
SSE	21.2 °C	3.8 mm	991.7 hPa
Alert Status	Humidity	Rainfall Velocity	Water Level
	78 %	- mm	0 cm