Current situation of volcano monitoring network in the Philippines

Toshiro Arai[1]

[1] Seimological and Volcanological Dept, JMA

The Philippine archipelago is one of the most volcanic active region in the world, and the PHIVOLCS (Philippine Institute of Volcanology and Seismology) continuously monitors the six (6) most active volcanoes (Pinatubo, Taal, Mayon, Bulusan, Canlaon and Hibok-hibok) in the Philippines.

After the upgrade of volcano observation instrumentation in existing manned observatories (replacement to new seismometers and digital equipment), which was implemented by the first phase of 'Project for Improvement of Earthquake and Volcano Monitoring System in the republic of the Philippines' of Japanese ODA,
* Unmanned seismic stations with radio communication (3 for 6 volcano, plus 1 for Parker and Matutum volcano)
* Middle period seismometers at manned observatories (6)
* Telemetered data receiving and processing system at manned observatories (6)
* Mobile seismometers, tiltmeters and GPSs
were additionally installed as the second phase of the project on March, 2003.

The Japan Meteorological Agency has been contributing to this project by dispatching several short/long term experts and receiving many trainees from the PHIVOLCS. We (hereto) introduce the current situation of volcano monitoring network in the Philippines.

Each unmanned seismic station established in project phase 2 has a shelter for storage of equipment, a Yagi antenna for wave transmission and a GPS receiver for time correction. A seismometer (short period velocity), a digitizer, a data logger, a transceiver and batteries are set inside the shelter and solar panels are put on the roof. Waveforms are sent to regional volcano observatory and repeater points may be placed on the way depending on transmission status. Composition of equipment at repeater points is the same as at unmanned seismic station except for the absence of a seismometer and related equipment. Middle period seismometers are installed in manned observatories for the detection of volcanic tremor in addition to phase read. All data both from unmanned stations and from middle period seismometer are sent to central system at each volcano observatory. It consists of data storage unit, data archiving server, data processing PC and network management PC and received data are automatically processed and archived. They can also be manually processed. Each observatory and PHIVOLCS head office at Quezon City are linked by a dedicated telephone line for FTP and transmission of phase data and hypocenter to the head office.

Network of four stations for one volcano is the minimum requirement for earthquake location and understanding of volcanic activity. But in case of volcanic unrest, more detailed monitoring is available by temporarily installing mobile equipment such as seismometers, transmitting observed data to the observatory and processing and analyzing these data in addition to data from permanent stations as the system is already planned to consider future or temporary expansion.