REPUBLIC OF THE PHILIPPINES
NATIONAL DISASTER RISK REDUCTION AND MANAGEMENT COUNCIL
National Disaster Risk Reduction and Management Center, Camp Aguinaldo, Quezon City, Philippines

NDRRMC UPDATE

Update on Alert Status and Activity of Taal, Mayon, Bulusan, and Kanlaon Volcanoes

Releasing Officer:

UNDERSECRETARY RICARDO B JALAD
Executive Director, NDRRMC and
Administrator, OCD

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I. SITUATION OVERVIEW

A. ALERT STATUS OF TAAL VOLCANO

This serves as a notice for the **lowering of Taal Volcano's status from Alert Level 4** (hazardous eruption imminent) **to Alert Level 3** (decreased tendency towards hazardous eruption).

Taal Volcano's condition in the two weeks following the 12-13 January 2020 phreatomagmatic eruption (main eruptive phase) has generally declined into less frequent volcanic earthquake activity, decelerated ground deformation of the Taal Caldera and Taal Volcano Island (TVI) edifices and weak steam/gas emissions at the Main Crater. These observations are supported by the following monitoring parameters:

1. Significant earthquakes recorded by the Philippine Seismic Network (PSN) across the Taal region declined from 959 to 27 events/day and peak magnitudes of M4.1 to M2.1 between 12 and 24 January. The Taal Volcano Network (TVN) likewise recorded a downtrend in volcanic earthquakes from 944 to 420 events/day between 17 and 24 January with a corresponding decline in the daily total seismic energy released. In particular, hybrid earthquakes that tracked post-eruptive recharge from Taal's deep magma reservoir to a shallow magma region beneath TVI ceased on 21 January, while the number and energy of low frequency events associated with activity in the shallow magma region diminished.

2. Global Positioning System (GPS) data recorded ground deformation after the main eruptive phase that included sudden widening of Taal Caldera by ~1 meter, uplift of its northwestern sector by ~20 centimeters and subsidence of the southwestern part of TVI by ~1 meter. These patterns were followed at much smaller rates between 15 and 22 January 2020 and were generally supported by field observations of lakewater recession by ~30 centimeters around Taal Lake as of yesterday. Field observations also measured a ~2.5 m lakewater recession along the southwestern lakeshore denoting uplift of portions of the Pansipit River Valley where fissuring has been reported. The overall pattern of ground deformation is for most part supported by InSAR (satellite) data. The overall pattern of ground deformation is for most part supported by InSAR (satellite) data and yields a net inflation of western Taal Volcano as a consequence of magma intrusion to the shallow magma region until 21 January.

3. After the main eruptive phase, activity in the Taal Main Crater diminished to infrequent weak ash eruptions and longer episodes of degassing or steaming that generated steam-laden plumes <1000 meters tall. This marked decline coupled with volcanic earthquake activity suggests stalling, degassing and reduction in gas pressures of eruptible magma in the shallow magmatic region that feeds surface eruptive activity.

4. Sulfur dioxide or SO2 flux based on campaign Flyspec data fluctuated between a high of ~5,300 tonnes/day on 13 January to a low of ~140 tonnes/day on 22 January but has steadied at an average of 250 tonnes/day in the last five days. This low concentration average is consistent with a progressively degassed shallow magma source and diminished plume activity.

In view of the above, PHIVOLCS-DOST is now lowering the alert status of Taal Volcano from Alert Level 4 to **Alert Level 3** to reflect the overall decrease in the level of monitoring parameters. Alert Level 3 means that there is a decreased tendency towards hazardous explosive eruption but should not be interpreted that unrest has ceased or that the threat of a hazardous eruption has disappeared. Should an uptrend or pronounced change in monitored parameters forewarn a potential hazardous explosive eruption, the Alert Level may be raised back to Alert Level 4. People residing within areas at high risk to base surges who have returned after the Alert Level was stepped down must thus be prepared for a quick and organized evacuation at such time. Conversely, should there be a persistent downtrend in monitored parameters after a sufficient observation period, the Alert Level will be further lowered to Alert Level 2.

DOST-PHIVOLCS reminds the public that at Alert Level 3, sudden steam-driven and even weak phreatomagmatic explosions, volcanic earthquakes, ashfall and lethal volcanic gas expulsions can occur and threaten areas within TVI and nearby lakeshores. DOSTPHIVOLCS recommends that entry into TVI, Taal's Permanent Danger Zone, as well as into areas over Taal Lake and communities west of TVI within a seven (7) kilometer-radius from the Main Crater must be strictly prohibited. Local government units are advised to assess areas outside the seven-kilometer radius for damages and road accessibilities and to strengthen preparedness, contingency and communication measures in case of renewed Unrest.

B. ALERT STATUS OF MAYON VOLCANO

Mayon Volcano's seismic monitoring network **did not detect any volcanic earthquakes** during the 24-hour observation period. Moderate emission of white steam-laden plumes that crept downslope before drifting west-southwest and west-northwest was observed. Sulfur dioxide (SO2) emission was measured at an average of 115 tonnes/day on 10 January 2020. Ground deformation data from Precise Leveling surveys obtained on 23 – 30 October 2019 indicate a slight deflation of the edifice relative to 16 – 25 July 2019. However, the volcano generally remains inflated relative to the early 2019 baseline level. This is consistent with recent electronic tilt data. Continuous GPS data also showed inflation of the edifice since February 2019.

Alert Level 2 currently prevails over Mayon Volcano. This means that Mayon is at a moderate level of unrest. DOST-PHIVOLCS reminds the public that sudden explosions, lava collapses, pyroclastic density currents or PDCs and ashfall can still occur and threaten areas in the upper to middle slopes of Mayon. DOST-PHIVOLCS recommends that entry into the six kilometer-radius Permanent Danger Zone or PDZ and a precautionary seven kilometer-radius Extended Danger Zone or EDZ in the south-southwest to east-northeast sector, stretching from Anoling, Camalig to Sta. Misericordia, Sto. Domingo must be strictly prohibited. People residing close to these danger areas are also advised to observe precautions associated with rockfalls, PDCs, and ashfall. Active stream/river channels and those identified as perennially lahar-prone areas on all sectors of the volcano should also be

avoided especially during extreme weather conditions when there is heavy and prolonged rainfall. Civil aviation authorities must advise pilots to avoid flying close to the volcano's summit as airborne ash and ballistic fragments from sudden explosions and PDCs may pose hazards to aircraft.

C. ALERT STATUS OF BULUSAN VOLCANO

Bulusan Volcano has returned to normalcy following a general decline in monitoring parameters. This is supported by the following observations:

1. **Volcanic Earthquake Activity**: The frequency of volcanic earthquakes has declined to baseline levels (0-2 earthquakes/day) since May 17, 2019. This indicates that rock fracturing within the volcanic system associated with hydrothermal activity has diminished.
2. **Ground Deformation**: Precise Leveling data indicated slight inflation of the mid-slopes since the second quarter of 2019 after a period of deflation in the beginning of the year, while continuous GPS data for the same period recorded apparent deflation of the edifice related rather to regional tectonic motion. The overall ground deformation data indicate that there is no pressurization from subsurface magma, with the deformation observed in the mid-slopes most likely due to seasonal changes within the shallow hydrothermal system.
3. **Gas Emission**: Sulfur dioxide emission or SO2 flux from Bulusan based on gas spectrometry remains below detection levels since 2018. The relatively low levels of SO2 flux indicate the depletion of volcanic gas supply from an active shallow hydrothermal or deep magmatic source. Ambient carbon dioxide (CO2) concentration is also decreasing in monitored springs around Bulusan Volcano.
4. **Visual Observation of the Summit**: Degassing activity from the active vents has been characterized by weak emission of steam-laden plumes consistent with diminished hydrothermal activity.

In view of the above, PHIVOLCS-DOST is now lowering the alert status of Bulusan from Alert Level 1 to **Alert Level 0 (normal)**. This means observational parameters have returned to baseline or background levels and no magmatic eruption is foreseen in the immediate future. However, in the event of a renewed increase in any one or combination of the above monitoring parameters, the alert status may step up once again to Alert Level 1.

D. ALERT STATUS OF KANLAON VOLCANO

Kanlaon Volcano has returned to normalcy following a general decline in monitoring parameters. This is supported by the following observations:

1. Volcanic Earthquake Activity: The frequency of volcanic earthquakes recorded by the Kanlaon's seismic monitoring network is within the baseline levels (0-2 earthquakes/day).
2. Ground Deformation: Recent data from continuous GPS observations and tiltmeter show no significant changes that can be attributed to volcanic activity.
3. Gas Emission: Sulfur dioxide emission or SO2 flux from the active crater is below 500 tonnes/day since August 2018.
4. Visual Observation of the Summit: Degassing activity from the active vent is characterized by weak emission of steam plumes, consistent to the diminished hydrothermal activity.

In view of the above, PHIVOLCS-DOST is now lowering the alert status of Kanlaon from Alert Level 1 to **Alert Level 0 (normal)**. This means observational parameters have returned to baseline or background levels and no magmatic eruption is foreseen in the immediate future. However, in the event of a renewed increase in any one or combination of the above monitoring parameters, the alert status may step up once again to Alert Level 1.

II. ACTIONS TAKEN

1. NDRRM Operations Center prepared NDRRMC Advisory and Update, and disseminated the same to OCD Regional Centers CALABARZON, V, VI and VII through NDRRMC website in order to closely monitor the situation and take appropriate actions for any new development.
2. Concerned NDRRMC member-agencies were provided with a copy of the Memorandum for the SND.
3. DOST-PHIVOLCS is closely monitoring the activities of Mayon, Taal, and Bulusan Volcanoes and any new development will be relayed to all concerned.