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The need of sustainable mitigation against the large amount of tephra deposits of Mount Batur Bali, Indonesia

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Batur is one of the finest known calderas on Earth and is the source of at least two major tephra eruptions, also called ignimbrite, with a combined volume of some 84 km^3 and 19 km^3. These tephras have similar compositions raising the question of whether they are genetically related. The Batur Tephra-1 (BI-1) is crystal poor, containing rhyodacite (68-70 wt.% SiO2), white to grey pumices and partly welded and unwelded. The overlying Batur Tephra-2 (BI2) is a homogeneous grey to black dacitic pumices (64-66 wt.% SiO2), unwelded and densely welded (40-60% vesicularity), crystal and lithic rich. Large explosive eruptions of Mount Batur have induced significant and long-lasting local impacts, e.g., as shown by the multi-decadal or multi-centennial response of biological proxies after tephra damages the vegetation cover, causing increased soil erosion, increased sedimentation rates and pronounced landscape destabilization and those large eruptions cause the widespread dispersal of Batur tephra is found in the southern part of Bali island since the past 20,000 years ago. The peat sediments show that tephra from Mount Batur, with a mean return interval of 10 to 5 thousand years and suggesting that, for any 10 year period in the last millennium, there is a 20% probability of a tephra event leaving detectable deposits in East part of Bali Island. The probability of potential hazards from two volcanoes, Batur and Agung in Bali is much higher, as the effects of smaller eruptions of Mount Batur are more localized the widespread tephras are restricted around the caldera rim. Mount Agung erupt hot clouds every 250-300 years, especially to the southern and southeastern valleys. The last eruption of Mount Agung was November 27, 2017 and continuing until now with moderate and small magnitudes, but it causes the disruption of flight out and its entry into Bali, so the decline of the tourists comes to Bali. Mitigation of volcanic hazards is vital to meet the long-term aims and multiple objectives of sustainability, i.e., continually monitoring of volcanic activities through volcanic observatory in Bali, safeguarding the environment as well as human living conditions, while meeting the needs of both current and future generations. Volcanic eruptions cause a wide range of hazards, of which tephra is by far the most widespread. Distal impacts over large regions occur due to exposure to tephra, gases, aerosols and volcanically modified precipitation and the additional impacts on climate and weather. Tephra-fall and the repeated floods due to the 2000 events led to damages in transportation, agriculture and tourism. Those tephra deposits have been developed to make up the Batur Unesco Global Geopark and conservation the area.

Biography

Igan S Sutawidjaja has his expertise in Volcanology. He has completed his Master's Degree in Volcanology from Victoria University of Wellington, New Zealand and is pursuing his Doctor's Degree about Geology and Volcanology in Padjadjaran University in Indonesia. He works in Center for Volcanology and Geological Hazard Mitigation, Geological Agency of Indonesia since 1982 and a Lecturer in Padjadjaran University. He works in many volcanoes, mainly in Indonesia and he developed a model of caldera formation and magma chamber model based of magmatic evolutions of some volcanoes including evaluation of volcanic hazard assessments through geological mapping, geochemical analyses, geophysical analyses and petrological analyses of volcanic rocks.

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