

# Sustainable Management of Local Natural Resources: Case Studies of Groundwater Management in the Philippines

**Date/Time: Friday, October 30, 10:00-12:00**

**Venue: Large Conference Room, IDEC**

**Speaker 1: Dr. Fernando P. Siringan,**

Professor, Marine Science Institute  
Velasquez St, University of the Philippines

**Title: Magnitudes of emergence and subsidence along the northwest coast of Bohol during the 2013 M7.2 earthquake**

## **Abstract:**

In October 15, 2013, a 7.2 magnitude earthquake with focal depth of 12 km shook Bohol Island and the rest of the Visayan region. The earthquake was generated by a previously unmapped fault. Movement of this fault led to uplift in Maribojoc and Loon and subsidence in the islands and mainland Tubigon. Field measurements, beach profiling and interviews were complemented by satellite image analysis to estimate magnitudes and extent of the vertical movements. High magnitudes of uplift (1.37 – 1.57 m) were measured along the southwestern coast of Maribojoc whereas high magnitudes of subsidence ( $\bar{x} = 0.58$  m,  $n = 7$ ) and greater damage were measured in parts of the pinnacle reef islands and mainland that were reclaimed. The spatial variation of the magnitude of uplift suggests bulging to the southwest of the Maribojoc and Loon headland while the trend of subsidence suggests a southeast downward tilt of the sea floor off mainland Tubigon. Overall lateral variations in the vertical motions indicate the occurrence of other faults which constrained the lateral continuity of motions. Geomorphic markers of previous stands of sea level suggest that the Loon– Maribojoc coast could have been vertically stable in the last 120,000 years whereas mainland Tubigon and its islands may have undergone subsidence in the Holocene. With or without post–seismic subsidence, communities atop the pinnacle reefs of Tubigon have to deal with increasing exposure to marine–related hazards.

**Speaker 2: Dr. Karen, Ann B. Jago–on**

Associate Professor, School of Urban and Regional  
planning, University of the Philippines

**Title: Impact of Water Resorts Development along Laguna de Bay on Groundwater Resources**

## **Abstract:**

Rapid urbanization and land use changes in areas along Laguna de Bay, Philippines, one of the largest freshwater lake in Southeast Asia, have resulted in increased economic activities and demand for groundwater resources from households, commerce and industries. One significant activity that can affect groundwater is the development of the water resorts industry, which includes hot springs spas. This study aims to determine the impact of the proliferation of these water resorts in Calamba and Los Banos in Laguna Province on the groundwater as a resource. This study also analyzes the issues and challenges in the implementation of policies and laws to regulate water use in these resorts.

Calamba, being the “Hot Spring Capital of the Philippines”, presently has more than 400 resorts, while Los Banos has at least 38 resorts. Results from an initial survey of resorts show that the swimming pools are drained/ changed on an average of 2–3 times a week or even daily during peak periods of tourist arrivals. This indicates a large demand on the groundwater. Monitoring of actual groundwater extraction is a challenge however, as most of these resorts operate without water use permits. If groundwater use is left unregulated, water availability for the resorts industry and for domestic, agriculture, commercial and other uses in the future will be negatively affected. It is necessary to strengthen implementation of laws and policies, and enhance partnerships among government, private sector groups, civil society and communities to promote groundwater sustainability.

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