

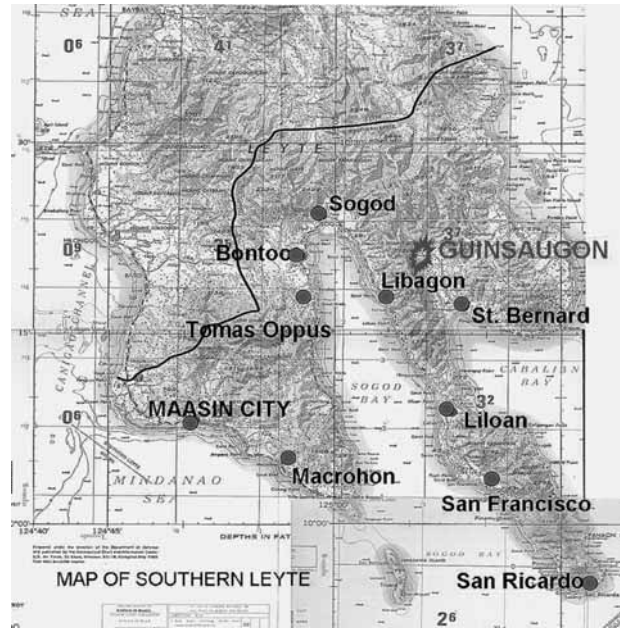
6-4. Landslide Survey Mission to the Leyte, the Philippines

A large-scale landslide struck the Island of Leyte, the Republic of the Philippines, on February 17, 2006. The IRP secretariat dispatched Mr. Murata, Recovery Expert to join the Japan-Philippines Joint Investigation Team to the Leyte Island (headed by Prof. Sasa of Kyoto Univ.) as part of its support to the post-disaster recovery of the landslide affected area. What follows reports the activities of the mission:

6-4-1. Summary of the landslide (Source: Philippines Govt.)

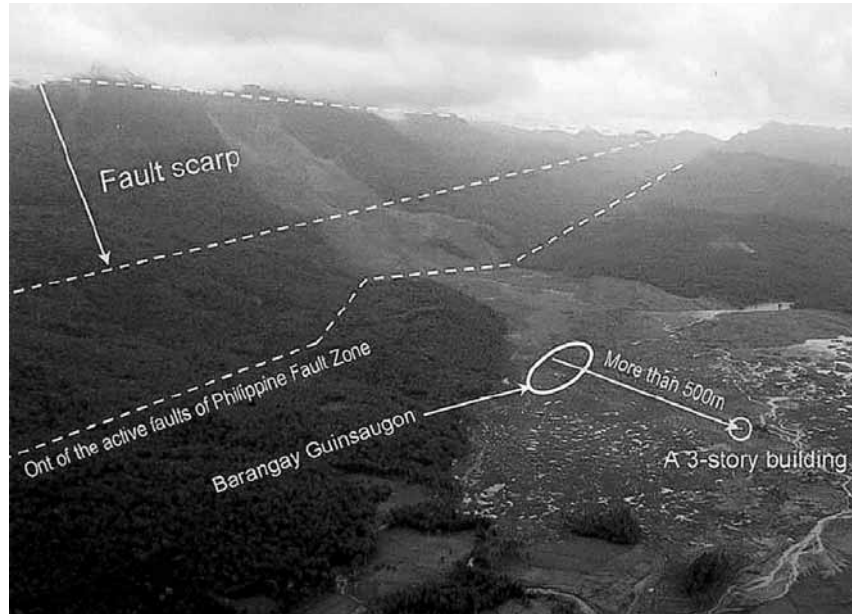
The 10-day total amount of rainfall since Feb. 8 had reached 674 mm (Libagon Weather Stn., Philippine Meteorological Service) - an approx. three-times of the average Feb. rainfall amount. Then, an earthquake occurred (M 2.6, according to PHIVOLCS) near a mountain near to the town of St. Bernard. The mountain collapsed from around 800 meters above sea level to bury the village of Guinsaugon (population: 1,860).

- Time of occurrence: 10:36 AM, Feb. 17, 2006 (Fri) (11:36, JST) (Probably immediately after an M 2.6 earthquake with a epicenter depth of 6 km)
- Deaths: 154, Missing: 990
- Sediment yield: 15 to 20 million m³ (estimate)
- Affected area: 300 ha (4 km from landslide site to furthest edge)
- Sediment depth: 6 to 7m (edges), 30m (skirts)
- Velocity: 100 to 140 km/h max.



6-4-2. Survey summary

- (1) **Period:** Mar. 19 (Sun) to 28 (Tue)
- (2) **Participants:** 24 individuals from Kyoto Univ. Disaster Prevention Research Center (Prof. Sasa, etc.), Niigata Univ., National Research Institute of Fire and Disaster, Forestry and Forest Products Research Institute, ADRC/IRP, Philippine Institute of Volcanology and Seismology, Philippine Univ., Philippines Govt. (Civil Defense Office) (Japan-Philippines Joint Investigation Team to the Leyte: Mar. 19 to 26)
- (3) **Activities**
 - Networking and information exchange with recovery related organizations on post disaster recovery in the Philippines, including UNDP
 - Visits to the Government of the Philippines (Social Welfare Secretary, Director of the Office of Civil Defense, Director of the Philippine Institute of Volcanology and Seismology, United Nations Resident Coordinator (RC: UN representative), Director of JICA Philippine Office, and Japanese Embassy <in Manila>
 - Interviews with South Leyte Governor and St. Bernard Mayor, and hearings at the field office of the Social Welfare Dept., refugee camps (set up in three schools), and relief supplies collection centers <in St. Bernard>
 - Participation in the Japan-Philippines joint survey team to investigate the cause of the landslide and identify potential hazard spots. Integration of the survey results into basic disaster mitigation data to be shared with UN organizations and relevant organizations.



Aerial photo of the affected area <quoted from the report by Ass. Prof. Hiroshi Suwa, Kyoto Univ. Disaster Prevention Research Center>

- Aerial observation of the landslide site and the affected area from a helicopter, soil sample collection at the fault scarp and floodplain (approx. 200 kg), terrain measurement, and river water surveys <in St. Bernard>

6-4-3. Achievements of IRP activities

(1) Assessment of recovery status and policy

- 1) Evacuees from the Guinsaugon village (520 individuals of 292 households as of Mar. 24) have taken refuge in the camp set up in a near-by high school. Evacuees from the adjacent potential landslide hazard areas have been grouped by village to live in camps set up in other schools (3,366 individuals of 916 households in total).
- 2) A rehabilitation and resettlement plan has been established for the all victim villages. According to the plan, a site with an area of 5.6 ha has already been procured in Magbagakay, a village close to the center of St. Bernard. U.S. troops have started land clearing.
- 3) Japan and other countries have provided financial support for housing recovery (\$535,000 for 500 households). Some of the fund will be allocated to the resettlement of the villagers displaced from the adjacent potential landslide hazard areas (site selection in progress).
- 4) Rapid construction of temporary accommodation facilities is under way in the relocation site (Magbagakay village) for the evacuees in the camps set up in schools. It is planned to complete the relocation of the evacuees by June to reopen the schools. Then, permanent dwellings will be constructed (a standard house will have a floor area of 20 m² and a lot area of 60 m²).
- 5) The landslide was a large-scale disaster with a death toll exceeding 1,000. As noted above, the recovery of the affected areas will revolve mainly around construction of new villages, consisting of approximately 300 households (large households will be divided and result in an increase of households because resettlement houses are small). Therefore, the recovery work will be of a scale that can be managed by the Philippine Government, exploiting its experiences of a number of disasters.

(2) UN activities and IRP support activities

- 1) Immediately after the occurrence of the landslide, the United Nations organized and dispatched a UNDAC team (headed by Dr. Puji Pujiono, OCHA Kobe) to coordinate emergency response activities, and made proposals towards recovery. Unlike in Pakistan, the

United Nations is not directly involved in recovery needs assessment surveys and other field activities on recovery because the extent and scale of the damage from the landslide was much smaller, as noted above, than that of the earthquake in Pakistan and within the capability of the country.

- 2) At the same time, this disaster has led the Philippines to start developing a hazard map covering its entire territory and planning mid-to-long-term disaster reduction strategies. The United Nations is expected to support the Philippines in these aspects.
- 3) The IRP intends to cooperate jointly with the UN Resident Coordinator in the Philippines through provision of a recovery guideline it is currently preparing based on national good practices on recovery and reconstruction as well as through dispatch of specialists.
- 4) As part of such efforts, the IRP provided important information for recovery, including the “Hyogo Framework for Action,” the role and missions of the IRP, and examples of good practices on recovery and reconstruction (such as the recovery and reconstruction project for Ichinomiya Town, Hyogo Prefecture), directly to decision makers in the affected area, including Southern Leyte Governor, St. Bernard Mayor, the Director of the Civil Defense Office, the Secretary of the Department of Social Welfare, and the UN Resident Coordinator.
- 5) Lessons from the landslide disaster include:
 - Concentration of the village population and public facilities in a potential landslide hazard area led to a massive human damage (the center of the village was on the skirts of the mountain).
 - The non-existence of an early warning and evacuation system, and a very low awareness of disaster reduction among the local population (absenteeism from drills) increased the severity of the disaster.
 - Overlooking of precursors of the landslide and failure to share information on such phenomena were also behind the aggravation of the disaster (some villagers were aware of cracks in the mountainside).
- 6) Key ingredients for future disaster strategies include:
 - Development of multi-hazard map covering the entire country (now in progress by the Central Government),
 - Establishment of middle-to-long term disaster reduction strategies and action plans involving communities (now in progress by the Central Government),
 - Establishment of a monitoring system for early warning based on cooperation of the local population (establishment of a communication network for sharing information on cracks in mountainsides and unusual changes in groundwater levels and river flow rates),
 - Provision of livelihood support to displaced peasants and widows with no income,
 - Integration of risk reduction (through construction of multi-hazard compatible houses), environment preservation, and implementation monitoring into rehabilitation and resettlement,
 - Inter-generation sharing of disaster experiences (construction of memorial facilities with educational functions), and
 - Facilitation of efficient cooperation with aid donor countries, aid donor organizations, and UN organizations (transition from bilateral to multilateral donor-recipient relationships).