Report on WEWAK Post-Earthquake Risk Assessment

9-11 September 2002
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Background:

An earthquake of moment magnitude (MW) 7.4, Richter magnitude (MR) 7.7, occurred at4.45 am local time at an epicentre about 70 km west-northwest of Wewak, at or near3oS 143oE. The earthquake was at relatively shallow depth (30 km depth reported byPort Moresby Geophysical Observatory) and was strongly felt in the Wewak area. Theearthquake was of significantly greater magnitude than that which caused adevastating tsunami at Aitape in 1998. A small tsunami was generated.

Details of this mission

At 11 am on 9 September this observer departed Port Moresby on aircraft P2-PNG andarrived Wewak 12.40 pm. At 2.40 pm the observer departed Wewak on helicopter P2-MTSin company of Minister Sir Peter Barter, Governor, East Sepik, Mr Arthur Somare,and a TV cameraman representing RTA and EM TV. The party returned to Wewak at about5.30 pm.On 10 September the observer visited sites along the coast west of Wewak, by roadand foot, in the company of Governor East Sepik Province, AAP journalist JimBaynes, and driver.On 11 September the observer visited the Murik people's settlement at Namba 2Pasis in Wewak, and returned to Port Moresby on P2-PNG, arriving 2 pm.

Objectives of mission:

1. To ascertain whether any people are at risk of further damage or injury following on from the earthquake of 9.9.02.
2. To talk with people, answer questions, and, as far as possible, reassure them so that the element of panic following the earthquake and tsunami is minimized. Please note that this is not a damage assessment report.

Method:

1. Aerial inspection of selected localities, looking for indications of unstable ground or slopes that might fail, and so might threaten villages or houses.
2. Visits to as many locations as possible, in the time available, to make on-the-ground inspections of possible hazardous sites, and talk with people.
3. Record details of damage, of earth movements and of tsunami wave run-up heights in as many places as possible, in the time available.

Localities inspected from the air (helicopter P2-MTS):

1. Mussu Island western end and part of centre
2. Kairiru island all coasts
3. Yuo and Keresau Islands
4. Walis and Tarawai Islands
5. Mainland coastline from Dagua east to Wewak

Localities inspected on the ground:

1. Sup village on Mussu
2. St Xavier College on Kairiru
3. Koragur (or Korgur) village on north coast of Kairiru
4. Yuo on south coast of Yuo Island
5. Tarawai on west coast of Tarawai Island
6. Walis on south coast of Walis Island
7. Boiken Baja near Boiken on mainland
8. But Mission on mainland
9. Kauk village on mainland
10. Dagua Mission on mainland
11. Kwabun village, east of Boiken
12. Katio hamlet on Hawain River
13. Ubidnim village (one of the Yuo villages) at mouth of Hawain River
14. Namba 2 Pasis (Murik people settlement) on Wewak peninsula
15. Coast Highway from Wewak to Kauk turn-off (past But)

Findings

1. No people were found to be at risk of further damage or injury arising from the earthquake and tsunami.
2. Where unstable conditions were recognized, for example at Koragur village, people had already taken appropriate action. At Koragur, the coastal cliff had become unstable and people already had marked off the unstable ground and had made plans to relocate houses that were at risk.
3. There appeared to have been uplift of about 30 cm along parts of the wave-cutplatform and reefs along the coast of Kairiru, Mussu and Tarawai Islands. This wasnoteworthy but presented no risk to people. Upward or downward movement of theearth's crust at the time of a strong earthquake is a relatively common phenomenon.The uplift needs to be checked again to ensure it was not a temporary effect.
4. Cracks developed in the ground on the beachfront at Kauk, and in and nearUbidnim village. At these and other locations, the subsurface sediments hadliquefied and had emerged up the cracks and in some cases squirted into the air.Liquefaction of subsurface sediments at the time of a strong earthquake is a commonphenomenon.
5. A crack that is reportedly causing concern to people on Keresau Island was notinspected, but should be inspected by a geologist. It is likely that it will proveto be similar to those seen at Kauk and Ubidnim.
6. The tsunami developed within minutes of the earthquake.
7. Tsunami run-up height (the maximum height reached by the tsunami wave as it cameashore) was in most places less than a metre, but was 1.5 m at Kauk, and reportedly3-4 m in the bay immediately east of the point at Boiken (location not visited bythis observer). Other observations of run-up height are being tabulated and will bereported separately.
8. The level of tsunami awareness in the coastal villages is high. People knew ofthe danger of a tsunami following the strongly felt earthquake, and moved inland.After the event, some islands people had left the islands for the same reason.
9. Almost all of the visible damage was caused by the earthquake, and not by thetsunami. Typical damage was for bush-material houses to have collapsed or to havetilted or twisted, and for tanks and water reticulation systems to have been brokenor disrupted.
10. Shallow water wells in some coastal villages became filled with sand, due tothe liquefaction and movement of subsurface sediments.
11. In most of the villages visited, about 10 percent of houses had collapsed and afurther 20-30 percent were damaged. The damage was not greater in the westernvillages, such as Kauk, as might have been expected in view of the location of theepicentre on or close to longitude 143oE.
12. Most or all deaths and injuries were caused by the collapse of houses, or aspeople escaped from houses.
13. Damage caused directly by the tsunami was reported in the bay immediately eastof the point at Boiken; on the southwest coast of Mussu; and in Victoria Bay onKairiru. None of these sites was visited by this observer.
14. People from coastal villages and some of the islands have retreated inland forfear of a tsunami. The people should be encouraged to return to their villagesbecause the risk of a tsunami developing is no greater than it was in the past.However, they should be encouraged to remain alert, as in the past, and to moveinland in the event of any strongly felt earthquake.

Conclusions:

1. No new risks or hazards
   The inspection carried out on 9-11 September indicated that in the aftermath of theearthquake and tsunami no new risks or hazards are threatening the population.
2. Further inspection
   However, not all sites were visited and it is desirable that a further inspectionbe made as soon as conveniently possible.
3. Resume normal life
   People who have voluntarily evacuated from the coast or islands should beencouraged to return to their villages and resume normal life.
4. Assistance needed
   Some people in most villages are temporarily without shelter, or have houses thatneed repair. In many villages water supplies have been disrupted. The people needassistance with temporary cover (tent flies), building materials, water containersand restoration of water supply reticulation systems, tanks and wells.

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