

ABSTRACT

Geological fieldwork has been carried out by Lemigas - the University of London group in Nias and Simeulue Islands in 1986 and 1987. Those islands form part of the Sunda forearc and characterized by outcrops of Neogene and Quaternary rocks. The main aim of that work is to investigate the tectonic history and geological evolution of this area which in terms of plate tectonics is considered as accretionary plate margin.

Apart from revision of stratigraphic framework our work has also indicated the occurrence of uplifted coral terrace on both islands, from which the pattern and rate of coastal deformation during the Holocene can be established (Situmorang et al., 1987). Studies on the chronology of vertical movements are considered necessary as it may help to complete geodynamic models for the area.

Our fieldwork indicates that carbonate more than 3-4 m above present high water tended to be strongly recrystallised and hence unsuitable for C_{14} assay. Suitable samples have been collected from several well-developed fossil shorelines at lower elevations at various points around Nias and Simeulue Islands. Preliminary C_{14} dating of emerge reefs on both islands indicate an average uplift rates of about 0.5 cm/yr, whereas paleontological evidence yields an average rate of 0.2 mm/yr for the last 20 million years (Moore et al., 1980).

Movement appears to have occurred spasmodically; several sections display three or four successive marine abrasion platforms whose ages are roughly 3000 years apart. A plausible explanation is that this is the recurrence interval between the seismic events responsible for uplift. At one of the dated sections on Nias, 1 km north of Gunung Sitoli, there is evidence of submergence of a coastal mangrove swamp by about 1.5 m some 6000 yr BP followed soon after by 2 m of uplift. On Simeulue Island northeastward tilting is superimposed on this uplift pattern.

NE Nias seems to have been experienced differential block faulting, with the Gunung Sitoli area displaying relatively faster uplift than the coasts north and south of it. Sinking of eastern Simeulue is regionally anomalous in that islands east of it display uplift comparably to that in West Simeulue and on Nias.

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