The role of the remarkable Seram-Kumawa strike-slip fault in the tectonic process of the northern Banda Arc system

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The Banda Arc system is sited in a junction of convergence between the Eurasian, Indo-Australian, Philippine and Pacific plates. It has a remarkable 180° curve in the Benioff zone. Two fundamental ideas have been invoked to explain this significant subduction-arc orientation change: (1) bent subduction zone around the Banda Sea (Hamilton, 1979; Spakman and Hall, 2010; Hall, 2012), or (2) oppositely dipping subduction zones (Cardwell and Isacks, 1978; McCaffrey, 1989), but no general agreement exists as to the cause of this curvature. However, a WNW-trending strike-slip fault, i.e. Seram-Kumawa fault, is observed at the north-eastern end of the Arc, cutting through the Seram accretionary wedge, prism and trench and seems to continue on the subducting plate (Hall et al., 2017). This fault is either inactive or locked temporarily at the present day, because there are very few strike-slip events along its trend while there are many thrust earthquakes on its north and northwest side. A few essential questions remain unanswered about this fault in relation to the evolution of the Banda Arc. For instance, what is the origin of this fault, what role does it play in the tectonic processes and large earthquakes along the Banda Arc. Could this fault eventually break-up the Banda Arc? What is its tectonic implication on the evolution of other highly curved subduction-arc systems? To address these questions, we will carry out a comprehensive investigation into active tectonics and seismicity occurrence along the northeast Banda Arc using high-resolution bathymetry, 2D marine seismic profiles and earthquake data.

Reference:


