Lessons learned from the recovery after the 2004 Indian Ocean tsunami in Sri Lanka

*Kazuhisa Goto[1], Nalin Ratnayake[2], Fumihiko Imamura[1]

1. International Research Institute of Disaster Science (IRIDeS),Tohoku University, 2. University of Moratuwa

Large tsunami is a low-frequency event and its impact continues for a long time. Therefore, long-term monitoring of impact and recovery after the event is crucial. In order to understand the lessons learned from the previous large tsunamis, we review the damages and recoveries both short-term and long-term after the 2004 Indian Ocean tsunami in Sri Lanka. Sri Lanka had been devastated by the 2004 tsunami, causing loss of approximately 30,000 people along the coastal area. In terms of impact to the natural coast, severe erosion and sedimentation has occurred both onshore and offshore. The recovery processes both for nature and human society have started soon after the event and continues even now in some extent. In fact, coastal environments have been well recovered and it is not easy to find any damages due to the tsunami along the coast. The affected human society has also recovered well, which is good for daily lives of local people. On the other hand, it is rather difficult to keep human memories about this event. Although, tsunami memorial monuments had been built in several places, part of the written characters were weathered and had become unreadable now. Considering that Sri Lanka has been suffered many costal disasaters including, tsunami, cyclones and severe coastal erosion, understanding and predicting past and future coastal hazards, development of a monitoring system, and capacity building are the keys for future disaster mitigation.

Recent progress on international collaborative projects of active fault and paleoseismology between Geological Survey of Japan and MTA, Turkey

*Hisao Kondo[1], Selim Ozalp[2]

1. Geological Survey of Japan, National Institute of Advanced Industrial Science and Technology, 2. General Directorate of Mineral Research & Exploration (MTA)

Over the last 30 years since 1980’s, General Directorate of Mineral Research & Exploration of Turkey (MTA) and Geological Survey of Japan have conducted international collaborative projects in the field of active fault and paleoseismological studies. Here, we introduce some of the results derived from the projects including on-going researches. The first progress since the initiation of the relationship between two organizations is mapping of the active faults all over the Turkey. The knowledge and technique of mapping of active faults has been exchanged and improved. The first active fault map over Turkey was published in 1992 by MTA at 1:1,000,000 scale. Later, more detailed mapping has been introduced using 1:10,000 scale airphoto interpretations, and now we have obtained renewal maps at 1:250,000 scale all over Turkey. The base maps of mapping were used at 1:25,000, then, they are compiled at 1:250,000 scale. Secondly, the first successful paleoseismic trench in Turkey has been brought under our collaborative project in 1990’s. After the occurrence of the 1999 Izmit and Duzce earthquakes, main purpose has shifted to paleoseismological researches on the North Anatolian fault system. Numerous successful paleoseismological researches have brought the exchange of knowledge and techniques. Now, MTA has already started to lead national project of paleoseismological researches of Turkey for long-term forecast of large earthquakes.

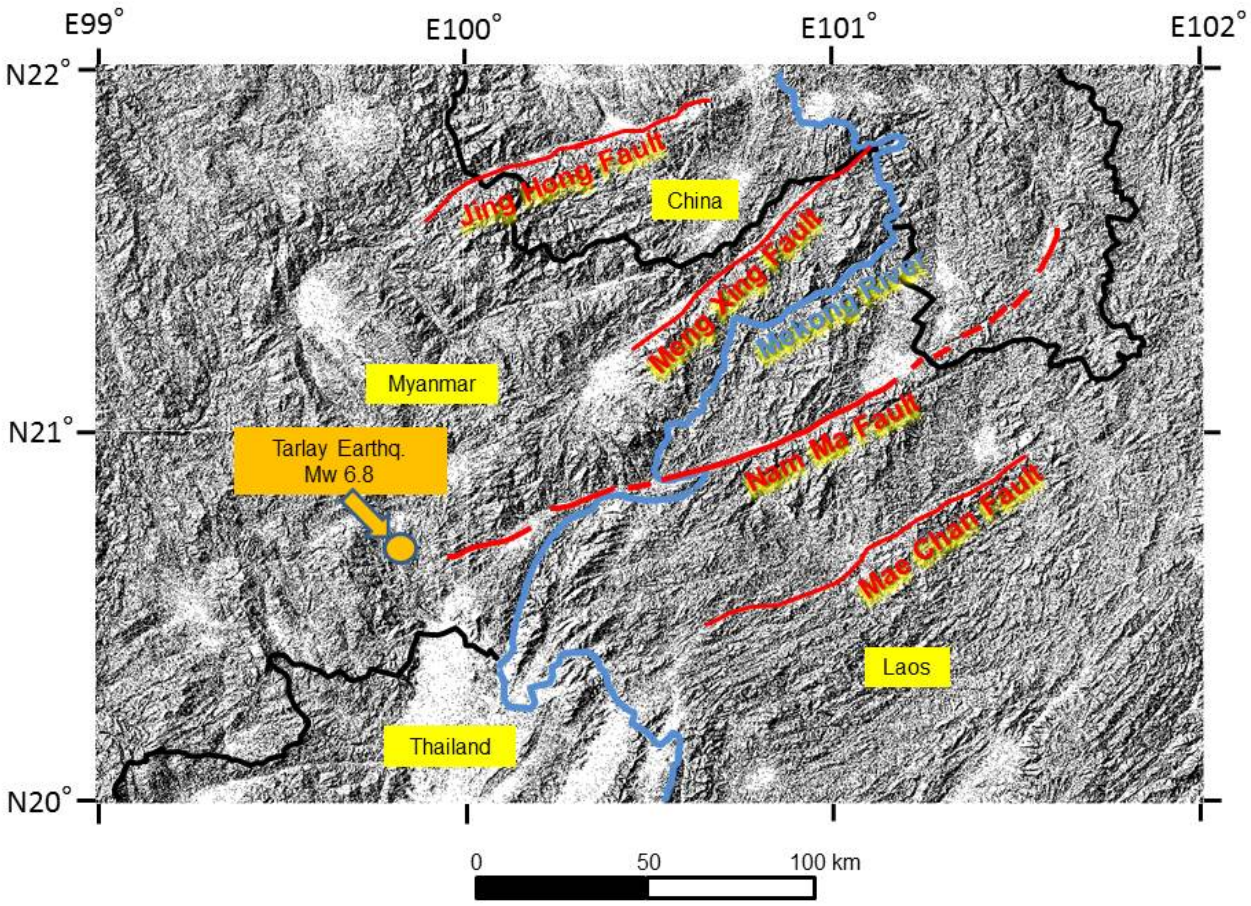
Earthquake (Mw 6.8) on 24th March 2011 caused by “international active fault” extending in Myanmar, Laos and China

*Yasukuni Okubo[1]

1. Japan Space Systems

In 24 March 2011, an earthquake at the scale of Mw 6.8 occurred near Tarlay in Myanmar, which is located in the border region of China, Laos, Thailand called Golden Triangle. The news about the earthquake was released not by an organization of Myanmar but by US Geological Survey.
In the past century, many significant and destructive earthquakes occurred in and around the Golden Triangle region including the 1976 Longling earthquakes (Mw 6.7 and Mw 6.6), the 1988 Lancang earthquake (Mw 7.0), and the 1995 Menglian earthquake (Mw 6.8). The 2011 Tarlay earthquake is the most recent in this series.
The Golden Triangle region is bounded by two major strike-slip boundaries: the Red River and the Sagaing fault zones. Between these zones, numerous lesser strike-slip faults cut a region of rugged relief that ranges in elevations from 500 to 3000 m. Most of these lesser faults strike northeast-southwest and are arcuate. Nam Ma fault, 215 km long, running through Myanmar, Laos and China is one of the faults.
By field observation after the shock, Soe et al. (2014) confirms that the earthquake resulted from rupture of a structurally distinct segment of the Nam Ma fault, bounded on the west by the fault’s terminus and on the east by the Tarlay basin stepover. If the 215 km Nam Ma fault were to rupture entirely in a single event, the magnitude of the resulting earthquake would likely be about Mw 7.7.
As the active faults cross over several countries and must damage a wide area, systematic observation under international cooperation is required.

Keywords: Earthquake, active fault, strike-slip fault, Myanmar, Golden Triangle



Active fault map and ASTER global digital elevation model in Turkey

*Yasukuni Okubo[1,2], Hisao Kondo[1], Hirokazu Kato[1]

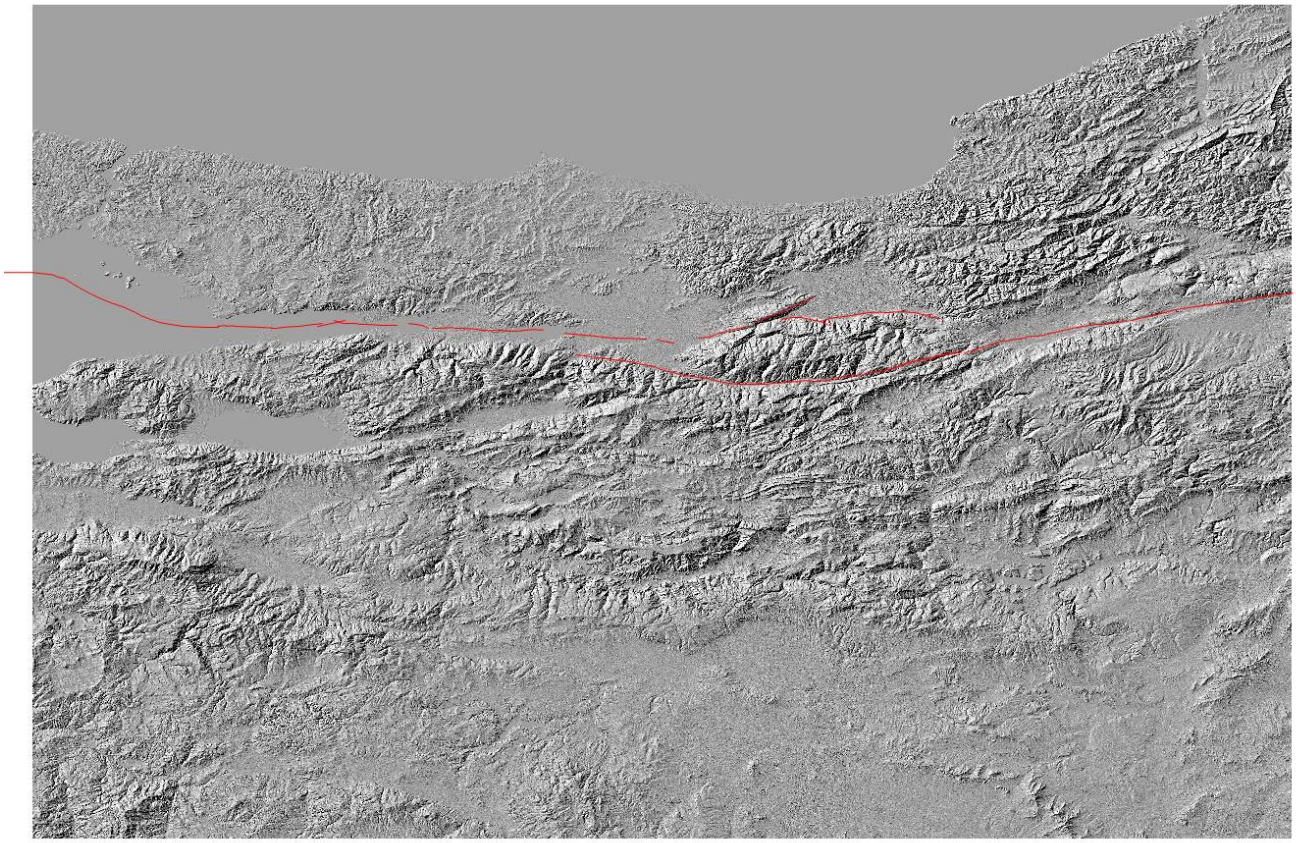
1. Geological Survey of Japan, 2. Japan Space Systems

Active fault map of the Turkish mainland, a guide document showing the geographic distribution and general characteristics of the active faults was published at a 1:1,250,000 scale by MTA (General Directorate of Mineral Research and Exploration, Turkey). This is the first seismotectonic database for Turkey under the framework of the National Earthquake Strategy and Action Plan—2023.

Turkey is located in one of the most seismically active regions in the world. On the basis of the data sets, 18 major seismotectonic zones were delineated for Turkey and the surrounding region. The compilation and storage of the seismotectonic data sets in a digital GIS will allow analyses and systematic updates as new data accrete over time.

ASTER GDEM (Global Digital Elevation Model) Version 2 with 30-meter postings has been released. The relief map delineates linear features, which clearly correspond to the active faults. These linear features in the GDEM suggest possibility to find more active faults.

Keywords: active fault, Turkey, Global Digital Elevation Model, ASTER, earthquake, seismotectonics



Resilience to floods in M’diq Fnideq province (Northern Morocco): a new methodological approach to managing the hydro-meteorological hazard

*Narjiss SATOUR[1], KASSOU Nadia[1], KACIMI Ilias[1], MAATOUK Mustapha[2], HOUT Radouane[1], BEN-Daoued Mohamed

1. Mohammed V University,Faculty of Sciences, Lab. Oceanology, Geodynamics and Geological Engineering (LO3G) Sec.Water and Environment Geology: Studies, Analysis and Research., 2. Abdelmalek ESSAADI ,Faculty of Science and Technology of Tangier

In the face of climate change, resilience has become an important goal for many cities around the world. Morocco, with the specifics linked to its geographical position and socio-economic factors, deserves to be more studied by new and different approaches, especially in the management of hydro-meteorological hazards, like floods. Several different traditional methods were used to modelling, understanding and anticipating the phenomenon but the urban resilience is studied by few authors in Morocco. The approach should uncover the role of the urban system components, economic, institutional and natural. The central aim of this study is to develop a new resilience strategy of M’diq Fnideq Province (North of Morocco) to floods, across temporal and spatial scales to maintain or rapidly return to desired functions in the face of disturbance, to adapt to change, and to quickly transform systems that limit current or future adaptive capacity.The Flood resilience index (FRI) is developed as an approach for evaluation of flood resilience using Geographic Information Systems. The research for this study started from the findings ad conclusion of Meerow, Sara. 2016 and Batica, Jelena 2015.

Keywords: Resilience, floods, Flood resilience index , hydro-meteorological hazards, climate change, Mdiq-Fnideq province

