Future Indonesian Tsunamis

Towards End-to-end Risk quantification (FITTER)

10–11 Nov 2022, Bandung, Indonesia

The FITTER project workshop took place in Bandung, Indonesia, on 10-11 November 2022. The aim of the workshop was to share the innovations of the tsunami risk model and research and the benefits of open risk modelling for improving risk management, with potential users in the hazard and disaster risk management community of Indonesia.

The workshop was organised by the IDF, in their role supporting project engagement and impact, in collaboration with the Research Center for Geological Disaster of the National Research and Innovation Agency (Badan Riset dan Inovasi Nasional, BRIN). The workshop was attended by over 35 people in person and c.40 online, with 15 speakers from the FITTER project, financial sector, and Indonesia scientific and disaster management agencies.

The FITTER project was convened in 2019 by the IDF RMSG to demonstrate that:

1. Open catastrophe models can be developed through collaboration between academic, public and private sector organisations to deliver open, accessible and transparent public-good risk models for disaster resilience.
2. Insurance industry catastrophe modelling approaches, for so long applied to property risk, can also be applied to other forms of disaster and climate impacts including socio-economic losses.

The attendees represented several departments of BRIN, Bandung Mitigasi HUB, BMKG (meteorological agency), BNPB (national disaster management authority), Bappenas (national planning agency), Disaster Risk Initiative (thinktank working in DRFI and DRM), Fiscal Policy Agency, IATSI (Indonesian Tsunami Scientists Society), the World Bank, six Indonesian universities.

The first day focussed on presenting the FITTER model focusing on the innovative hazard and social vulnerability components, and sharing applications of tsunami hazard and risk information in Indonesia. This included vessel evacuation from ports, preparedness of

exposed communities in the TsunamiReady program, early warning system, and understanding insurance for fishermen. The second day broadened to look at the application of risk analytics for financial resilience, hearing about open risk modelling in Oasis Loss Modelling Framework and the InaRisk platform . The Fiscal Policy Agency demonstrated their government financial management framework, and BRIN showed approaches to economic valuation of tsunami losses including natural assets. We also featured other innovative research funded under the FITTER project, on landslide hazard around the new capital site, and high-resolution flow simulating ports, which were seen as impactful research.

Key outcomes

There was great interest in the FITTER project and potential applications in infrastructure resilience, urban spatial planning, and building code development, risk-based pricing in resilient development and to inform sovereign catastrophe bonds. The innovative capability of the model to use household economic data to estimate household asset losses and health expenses using probabilistic methodology was also well received and opens up the potential for further research into and management of socioeconomic impacts.

Many of the presentations from Indonesian experts showed how the research funded by FITTER could add value. For example, providing a probabilistic view of tsunami inundation hazard, which could provide a greater number of plausible events into processes currently using a limited number of selected scenarios. It would be valuable to compare hazard maps produced by modelling the BMKG tsunamigenic source database and by the UCL statistical emulation process to better understand uncertainty in inundation. Further research might also investigate the impact of including more source events from BMKG, on the inundation statistics produced by the emulation.

Importantly, the FITTER model and its availability in Oasis LMF could help address the existing gap in translating tsunami hazard information into risk estimates. This provides opportunities for more risk-informed decision-making and to unlock public and private sector investment in resilience measures, including risk financing and insurance. BRIN researchers are now using Oasis LMF to advance their risk analytics capabilities.

In the short term, there will be continued collaboration between UCL and BRIN on vessel evacuation and tsunami flows in ports. There is also great enthusiasm among the BRIN researchers present, to learn and use the Oasis LMF, with several early career researchers already now learning to implement Oasis. Opportunities emerged to extend application of household data into financial risk models in other countries, for example as increased collaboration between UCL and Oasis in Bangladesh, and a need to document the implementation of household data as household asset loss vulnerability curves.

Feedback on the event was overwhelmingly positive from the project team and Indonesian partners and it is clear from several conversations that we have created opportunities for new dialogue in many areas through holding this workshop. It has undoubtedly created increased impact for the project within the project timeframe, which should grow over time in the form of collaboration between researchers, and researchers and industry, and through practical application of industry tools, for which the implementation of the FITTER model in Oasis has been the catalyst.