

# Case Study: InaSAFE for Disaster Risk Assessment in South Sulawesi

## Background

From April to June 2015, the Australia Indonesia Facility for Disaster Reduction (AIFDR) and Humanitarian OpenStreetMap Team Indonesia (HOT ID), through the Capacity Development Support Program (CDSP), assisted the Provincial Disaster Management Agency of South Sulawesi (BPBD South Sulawesi) to conduct a disaster risk assessment of South Sulawesi province. The types of supports provided include developing and updating a disaster risk assessment document, which was expected to be the basis of planning and disaster management policy in the future.

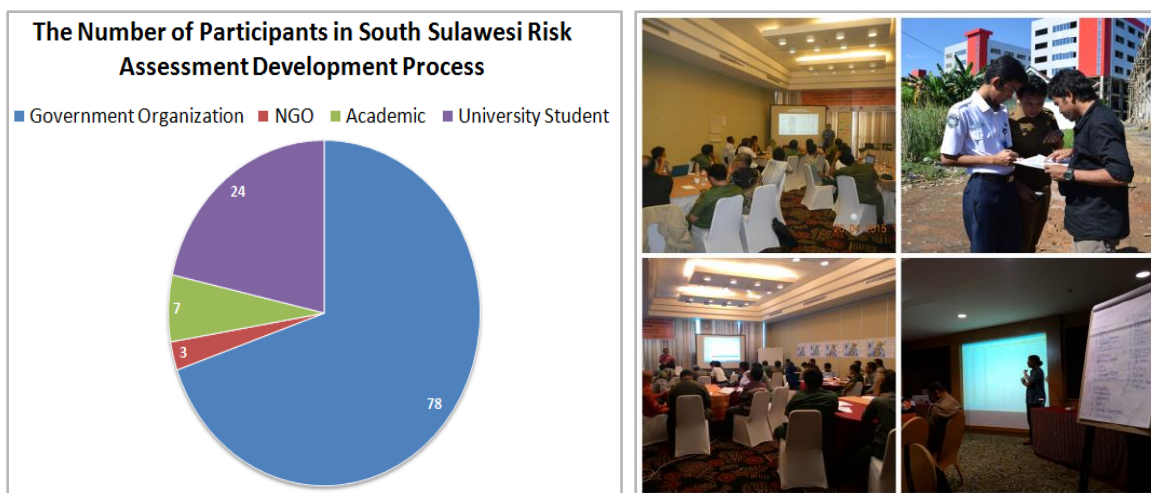


Figure 1 Participants in the South Sulawesi Risk Assessment Development Process

In order to ensure a comprehensive and inclusive planning document, this program involved participants from BPBD South Sulawesi and relevant stakeholders including the Provincial Development Planning Agency (Bappeda); Geophysics, Meteorology and Climatology Agency (BMKG); Watershed Management Agency of Jeneberang (Balai Besar Wilayah Sungai Jeneberang); Water Resource Management Agency (Dinas Pengelolaan Sumber Daya Air); Health Agency (Dinas Kesehatan); Forestry Agency (Dinas Kehutanan); academic institutions; Indonesia's Red Cross and university students.

## Implementation

The disaster risk assessment process was implemented in five stages:

1. First workshop on disaster risk assessment
2. Training and exposure mapping
3. Second workshop on disaster risk assessment
4. Public consultation, and
5. Finalization of disaster risk assessment document.

The objective of the first workshop was to build consensus among stakeholders, especially in terms of selecting the data set that is available and the parameters to be used. The selected data and parameters were to be used as a reference for scoring capacity and vulnerability from village data, before turned into an earthquake and landslide risk map using QGIS and InaSAFE. The second, but equally important objective of this workshop, was to develop a better understanding of the risk assessment development process among all participants.

On the second stage, a training was conducted, followed by a field survey of the Jeneberang Watershed. The objective of this activity was to improve and update building and road data using OpenStreetMap (OSM). Remote mapping was conducted using HOT Tasking Manager<sup>1</sup> in three priority areas such as Jeneberang Watershed, Luwu Raya, and around Tempe Lake.

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<sup>1</sup> HOT Tasking Manager is a mapping tool designed and built for the Humanitarian OSM Team collaborative mapping. The purpose of the tool is to divide up a mapping job into smaller tasks that can be completed rapidly. It shows which areas need to be mapped and which areas need the mapping validated.



*Figure 2. Exposure map in three priority areas*

In the second workshop, the participants produced six disaster risk maps of South Sulawesi, which covers earthquake, flood, drought, typhoon, fire, and landslide. They also produced a risk evaluation of the area's population, public facilities, common buildings and land use for each disaster scenario using InaSAFE and geoprocessing tools in QGIS.

A public consultation was conducted before printing and dissemination of the final disaster risk assessment. The event was attended by representatives from Local Disaster Management Agency (BPBD) in each city/district in South Sulawesi Province as participants. This event aimed to identify issues, views, comments, needs and attitudes towards disaster risk assessment in South Sulawesi, in order to enhance the disaster risk assessment outcome document by collecting responses and input from stakeholders.

After the public consultation is done, the team revised the assessment document based on the comment, feedback and opinion from the public consultation participants, who understand more about the conditions in their area. Once completed, the document was then handed over to BPBD of South Sulawesi.

## Result

The disaster risk assessment process facilitated production of a disaster risk assessment document and disaster risk maps, which cover different scenarios including flood, earthquake, landslide, typhoon, extreme waves, abrasion, tsunami, epidemics, social conflict technological failure scenarios. The resulting disaster risk map is equipped with a risk evaluation using InaSAFE scenario results describing the number of affected buildings and population. In addition, the participants have mapped buildings and infrastructure in three priority areas (Jeneberang, Luwu Raya, and Tempe Lake) using OSM.

The disaster risk assessment documents and maps were created as a reference document for the government, so they could integrate disaster risk reduction perspectives in their planning. The document and map presents a full overview of the disaster risk in an area by analyzing the level of hazard, vulnerability, capacity and disaster risk in the area.

*Table 1. Earthquake Risk in South Sulawesi*

<b>Classes</b>	<b>Population (person)</b>	<b>Building</b>	<b>Settlement (Ha)</b>	<b>Rice field (Ha)</b>	<b>Farmland (Ha)</b>
Low	3.389.000	291.104	17.940	182.920	428.253
Middle	1.269.000	214.877	23.864	257.025	301.796
High	3.371.000	357.981	14.566	196.070	140.676
Total Affected	8.027.000	863.962	56.371	636.016	870.727

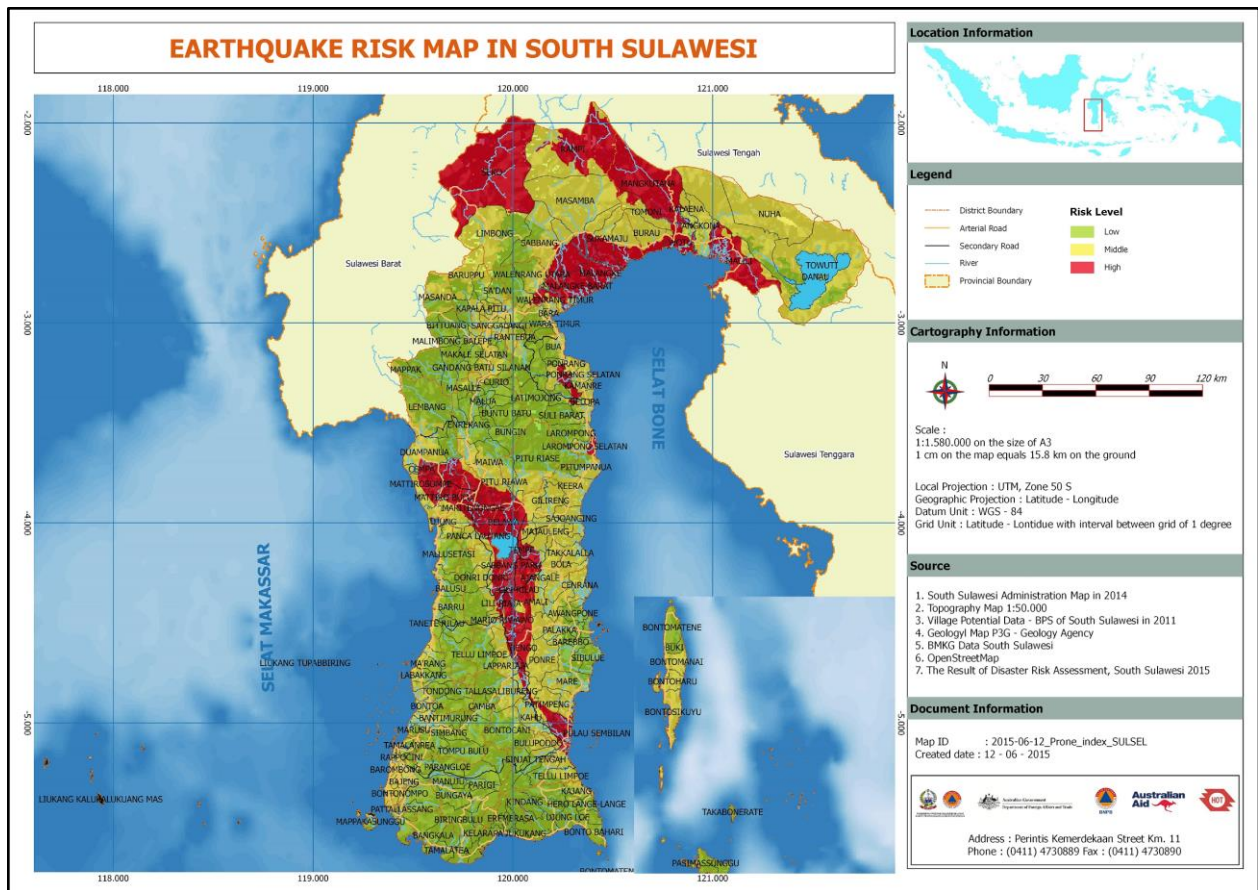


Figure 3. South Sulawesi Earthquake Risk Map

## Lessons Learned

- Since accessing data and information from the government was challenging, it was useful to explore different resources. The challenge came from complicated bureaucracy of the local institutions/agencies in South Sulawesi and their lack of willingness in sharing the data, which hinders the data collection. Due to such challenge, the team decided to utilize data that was available from one of the project in AIFDR (earthquake mapping data from the Geological Agency), as well as combining the data with village potential data (PODES) published by the National Statistical Agency to improve its quality.
- The disaster risk assessment calculation in InaSAFE require large amounts of laptop memory. This is because it contains provincial level data and has a wide coverage area. The participants should be informed of the minimum specifications<sup>2</sup> of their laptops, so that they can run InaSAFE and geoprocessing efficiently.

<sup>2</sup> The specifications of laptop for participants include for Windows using 64 bit version, minimum memory capacity of 4GB, and the processor is Core i5 - Core i7.

- The disaster risk assessment activity should involve academics, including both university students and lecturers, who are experienced in using OSM, QGIS and InaSAFE. They were very helpful during the process.
- Through these activities, stakeholders experienced the entire risk assessment process from the beginning to the end. It is recommended for them to be actively involved in related programs/activities in the future such as continue to update the assessment.
- In the public consultation workshop, there were many pieces of advice, recommendations and suggestions from stakeholder representatives in each district/city in South Sulawesi. They could be used as inputs for the disaster risk assessment document, since these representatives are likely more aware of the situation and conditions in their own area.