



AUSTRALIA-INDONESIA COOPERATION IN NATURAL DISASTER MANAGEMENT IN INDONESIA THROUGH THE AIFDR PROGRAM 2009-2015

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Abstract:

The purpose of this research is to explain Australia's cooperation with Indonesia in managing Indonesian natural disasters through the Australia - Indonesia Facility for Disaster Reduction (AIFDR) programme during 2009-2015. Australia is one of the countries that actively and sympathetically engage with Indonesia on a range of social and international issues, including disaster management. The establishment of the AIFDR was prompted by the weakness of Indonesia's disaster management system, as evidenced by the establishment of a disaster management legal entity with a coordination line under the President in 2008 after several disasters. This article contains three of the many results of AIFDR cooperation during this period.

Keywords: Australia, Indonesia, cooperation, AIFDR, disasters.

Titulo en Español: *La cooperación de Australia con Indonesia en la gestión de catástrofes naturales en Indonesia a través del Programa AIFDR 2009-2015.*

Resumen:

El objetivo de esta investigación es explicar la cooperación de Australia con Indonesia en la gestión de catástrofes naturales indonesias a través del programa del Mecanismo Australia-Indonesia para la Reducción de Desastres (AIFDR) durante 2009-2015. Australia es uno de los países que colaboran activa y solidariamente con Indonesia en una serie de asuntos internacionales, así como en la gestión de catástrofes y cuestiones sociales. La creación del AIFDR se vio impulsada por la debilidad del sistema de gestión de catástrofes de Indonesia, evidenciada por el establecimiento en 2008, tras varias catástrofes, de una entidad jurídica de gestión de catástrofes con una línea de coordinación dependiente del Presidente. Este artículo recoge tres de los diversos resultados de la cooperación de la AIFDR durante este periodo.

Palabras Clave : Australia, Indonesia, cooperación, AIFDR, desastres.

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DOI: <http://dx.doi.org/10.31439/UNISCI-202>



1. Introduction

Australia is a very active and responsive country on a wide range of international issues. As an active and watchful country that is often involved in assisting countries in need through many types of support such as financial, technical, and other intangible assistance, Australia's commitment is evident in its assistance to the Indonesian government in those sectors through the years³. Despite ups and downs in ties between the two countries, cooperation between the two countries continues. Political tensions between the two nations have little impact on economic or social cooperation⁴. This can be seen in trade and investment activities, as well as in the assistance that Australia continues to provide to Indonesia's development in a variety of sectors, particularly disaster management. Aid and assistance in reaction to the Nias earthquake in North Sumatra, the Mentawai Islands earthquake in West Sumatra, and the Mount Merapi eruption in Yogyakarta, were examples of this commitment⁵.

Following the 2004 Indian Ocean tsunami, which killed over 280,000 people, displaced over 500,000, and caused economic damages estimated at US\$4.5 billion, disaster risk management and response became a national priority for Indonesia⁶. Given its location at the Pacific Ring of Fire and at the meeting point of three tectonic plates, Indonesia faces the problems of a population that is very vulnerable to sensitive ecosystems⁷. More than 90% of Indonesia's 262 million people are vulnerable to global hazards such as volcanoes, earthquakes, and tsunamis⁸. Indonesia spends \$300-500 million each year on disaster recovery, amounting for 0.3 percent of national GDP during serious disaster years and 45 percent at the provincial level⁹.

Following the Indian Ocean Tsunami, Indonesia had only just enacted legislation Undang-Undang No. 24 Tahun 2007, which established special disaster management legislation and authorities based on the ratification of the Hyogo Framework for Action (HFA), a result from the World Conference on Disaster Risk Reduction, on 18-22 January 2005¹⁰. Based on this law, Indonesia formally formed the National Disaster Management Agency (BNPB) and the Provincial Disaster Management Agency (BPBD) in 2008. The BPBD was established at a regional scale to coordinate actions before, during, and after disasters throughout each of the provinces of Indonesia¹¹.

An analysis by Australia concluded that these relatively new institutions were underfunded and lacked technical proficiency. BPBD at the provincial and district level

³ Clare, Angela: 'Foreign Aid Budget', Parliament of Australia, 2022, at https://www.aph.gov.au/About_Parliament/Parliamentary_Departments/Parliamentary_Library/pubs/rp/BudgetReview202223/ForeignAidBudget

⁴ Murtasidin, Bahjatul: "Kepentingan Ekonomi Politik Indonesia Dalam Kerjasama Comprehensive Economic Partnership Agreement Dengan Australia", *JDP (Jurnal Dinamika Pemerintahan)*, Vol. 4, n° 1 (January 2021), pp. 52–63.

⁵ Ita: "Australia Berikan Bantuan Ke Indonesia Untuk Atasi Bencana", *Detik News*, 29 October 2010.

⁶ Nugraha, Ricky Mohammad; Afifa, Laila: "15 Years On; Behind the Catastrophic Aceh Tsunami and Earthquake", *Tempo*, 26 December 2019.

⁷ Paton, Douglas: "Living on the Ring of Fire: Perspectives on Managing Natural Hazard Risk in Pacific Rim Countries", *Journal of Pacific Rim Psychology*, Vol. 3, n° 1 (2009), 1–3.

⁸ Dilley, Maxx; Chen, Robert S.; Deichmann, Uwe; Lerner-Lam, Arthur L.; Arnold, Margaret: Natural Disaster Hotspots: A Global Risk Analysis, *International Bank for Reconstruction and Development/The World Bank and Columbia University* (March 2005) pp. 4-7.

⁹ *Indonesia: Advancing a National Disaster Risk Financing Strategy – Options for Consideration*, <https://www.gfdrr.org/sites/default/files/publication/Indonesia_DRFI_Report_FINALOct11.pdf.

¹⁰ Indonesia, *Undang-Undang (UU) No. 24 Tahun 2007* (2007).

¹¹ *Sejarah Berdirinya BNPB*, at <https://www.bnpb.go.id/sejarah-bnpb>



typically relies on central government funds, which are often limited¹². Regional BPBDs normally get less than 1% of the province or district budget and are not frequently funded for activities and/or programs, but they are tasked with conducting risk assessments and contingency plans¹³. Based on this fact, Australia steps into disaster management plans through the Australia-Indonesia Facility for Disaster Reduction (AIFDR) with funding from Australian Agency for International Development (AusAID)¹⁴. AIFDR evolved from a political commitment between Australia's 26th Prime Minister, Kevin Rudd, and Indonesia's 6th President, Susilo Bambang Yudhoyono. The partnership was officially unveiled during the 2008 Asia-Pacific Economic Cooperation (APEC) conference and went into effect in 2009¹⁵. Australia is also collaborating with the National Disaster Management Agency (BNPB) on scientific data collecting, software technologies, and training to aid in disaster relief that Indonesia addresses within natural hazard threats such as earthquakes, tsunamis, volcanoes, and floods¹⁶. These initiatives supplement AIFDR's set of disaster management capacity-building programs at the national, provincial, and district levels. AIFDR increases community resilience to natural disasters via collaborations with NGOs and civil society organizations¹⁷. AIFDR also contributes to regional disaster risk management through collaborations with ASEAN and the UN¹⁸.

This article aims to observe and elaborate the results of the cooperation between Australia and Indonesia in natural disaster management through the Australia Indonesia Facility for Disaster Reduction Program in Indonesia from 2009 to 2015. It explores the implementation of three specific expertise of AIFDR, which are: Training and Outreach, Partnerships, and Risks and Vulnerabilities, and how AIFDR operates in Indonesia by improving the technology related to disaster management system and create a collaboration structure alongside national disaster management institutions and local governments.

2. Literature Review

Regarding Australia and Indonesia's cooperation many have noted the frequent strategic partnership between both countries as Indonesia and Australia share geographical border in the southern hemisphere (e.g., Hitchens 1994; McKenzie 2017; Soedarman, Pramono and Halkis 2020; Lestari 2021; Fahadayna 2021; As'Ad and Nafilah 2022 etc), and because of this, researchers have highlighted the security partnership of both countries frequently. In their article, As'ad and Nafilah brought forwards Indonesia and Australia's security partnership with The Bali Process and Lombok Treaty for a goal of maritime security against smuggling and illegal transmigration¹⁹. Soedarman, Pramono, and Halkis describe the "Free and Open" policy

¹² *Investment Design Australia-Indonesia Partnership in Disaster Risk Management* at <https://apo.org.au/sites/default/files/2020-02/apo-nid214691-1276741.pdf>

¹³ Pellini, Arnaldo (2003): *You Have to Know Who Lives in Danger: Political Economy of Strengthening Community Resilience to Natural Disasters in Indonesia*, London, Oxfam.

¹⁴ *Strengthening Disaster Reporting This Disaster Risk Reduction Month* at https://indonesia.embassy.gov.au/jakt/MR11_082.html

¹⁵ Kompas: "APEC: Reformasi IMF", *Kompas*, 24 October 2008.

¹⁶ *Ibid.*

¹⁷ *Australia-Indonesia Facility for Disaster Reduction (AIFDR)* at <https://bnpb.go.id/berita/australia-indonesia-facility-for-disaster-reduction-aifdr>.

¹⁸ *Australia-Indonesia Facility for Disaster Reduction: Review of Phase 1* at <https://www.dfat.gov.au/sites/default/files/independent-review-of-aifdr-phase-1.pdf>.

¹⁹ As'ad, Istiqomah Febrian Alda, Farah Nafilah Regina: "Indonesia as a Global Maritime Fulcrum: Examining the Model of Indonesia-Australia Maritime Cooperation and Its Impacts to Achieve Indonesia's Global Maritime Fulcrum Security Agenda", *Hasanuddin Journal of Strategic and International Studies (HJSIS)*, Vol. 1, n° 1 (2022), pp. 17–30.



that binds both countries but is not perfectly aligned with Indonesia's interest²⁰. Hitchens examines the ups and downs in terms of Indonesia's compliance to The Australia-Indonesia Zone of Cooperation treaty²¹. There are also highlights of Australia and Indonesia cooperating to strengthen Cybersecurity²², both states' national police forces cooperation²³, and Counter-Terrorism that firm up the high-level security issues focused on by Indonesia and Australia's cooperation researchers²⁴.

Writings about Indonesia and Australia's cooperation through AusAID is dominated by cultural and educational aspects. Cresswell discusses ocean expeditions funds in ASEAN, including Indonesian seas²⁵. Allen discusses offshore programs in furthering plans of reforming teaching methods in Indonesia, who has a goal of educational reformation supported by Australia²⁶. Alfiano et.al, in their articles focuses on educational aid from AusAID to Indonesia, both into pedagogical funding and cultural education funding²⁷.

On mentioning AusAID for foreign disaster aid or disaster management, most articles are discussing the technical aspects of the process and results of the AIFDR program (e.g., Griffith, Ingham and Weller 2010; Pranantyo and Fadmastuti 2014; Bear-Crozier 2016). The examination of Griffith et. al focuses on AusAID funding the research on the structural damage of the highly devastating Padang earthquake²⁸. Pranantyo and Fadmastuti discusses the InaSAFE funded by AusAID through AIFDR, along with the software program's usage and data collection methods but not the efforts and result of AIFDR in general²⁹. Bear-Crozier examines about systematic volcanic geohazard issues, also funded by AIFDR³⁰.

The existing literature on Australia-Indonesia partnerships in other sectors has provided the basis for a broader understanding of the AIFDR and its facilitation of Australia-Indonesia cooperation in disaster management.

3. Methods

This research uses the qualitative method that aims to understand International Relations in the form of bilateral cooperation through financial and intellectual aid for disaster management

²⁰ Soedarman, Yoedhi Swastanto; Pramono, Budi; and Halkis, Mhd: "Free and Open Indo-Pacific in Defense Cooperation between Indonesia and Australia", *Technium: Romanian Journal of Applied Sciences and Technology*, Vol. 2, n° 7 (2020), pp. 258–66.

²¹ Hitchens, Michael: "The Australia-Indonesia Zone of Cooperation Treaty", *Energy Policy*, Vol. 22, n° 4 (1994), pp. 345–51.

²² Lestari, Elva Azzahra Puji: "Complex Interdependence Between Indonesia-Australia Through Cybersecurity Cooperation Post-Indonesia-Australia Cyberwar in 2013", *Jurnal Hubungan Internasional*, Vol. 9, n° 2 (October-March 2021), pp. 178–88.

²³ Pamulatsih, Heni Yekti and Perwita, Anak Agung Banyu: Bhayangkara and Platypus: The Cooperation between Indonesian National Police (Polri) and Australian Federal Police (AFP) in Dealing with Terrorism Threat in the Post of Lombok Treaty", *Indonesian Perspective*, Vol. 5, n° 2 (July- December 2020), pp. 119–37.

²⁴ Fahadayna, Adhi Cahya: "Australia-Indonesia Counter-Terrorism Cooperation", *Transformasi Global*, Vol. 5, n° 2 (2008), pp. 68–79.

²⁵ Cresswell, George: "The ASEAN-Australia Regional Ocean Dynamics Expeditions 1993-1995", *Maritime Studies*, Vol. 1995, n° 85 (2014), pp. 13–20.

²⁶ Allen, William; Hyde, Mervyn; Whannel, Robert; O'Neill, Maureen: "Teacher Reform in Indonesia: Can Offshore Programs Create Lasting Pedagogical Shift?", *Asia-Pacific Journal of Teacher Education*, Vol. 46, n° 1 (July 2018), pp. 22–37.

²⁷ *Ibid.*

²⁸ Griffith, Michael. C., Ingham Jason M., and Weller Richard: "Earthquake Reconnaissance: Forensic Engineering on an Urban Scale", *Australian Journal of Structural Engineering*, Vol.11, n°1 (2010), pp. 63–74.

²⁹ Pranantyo, Ignatius Ryan; Fadmastuti, Mahardika; Chandra, Fredy: "InaSAFE Applications in Disaster Preparedness", in *AIP Conference Proceedings*, 2015, MDCLVIII.

³⁰ Bear-Crozier, A N; Kartadinata, N; Heriwaseso, A; Nielsen, O: "Evaluating a Volcanic Ash Ground-Loading Hazard at Gunung Ciremai, West Java, Indonesia Using PF3D", *London Geological Society, Special Publications*, Vol. 441, n° 1 (2017), pp. 189–98.



between Australia and Indonesia. The unit of analysis that will be examined is the operation of AIFDR in Indonesia and the results of those efforts.

The data and information in this research are obtained from the secondary source consisted of the literature review from previous relevant research on the topic of Australia and Indonesia's relations and disaster management in Indonesia before and throughout the 2009–2015-time frame that were written in various journals, reports, news articles, as well as documents from website.

The authors gathered the existing data and information from different sources to create a comprehensive and systematic discussion.

4. Results and Discussion

AIFDR was introduced after the ratification of Hyogo Framework for Action and years of research which formed the legislative statute UU No. 24 about Disaster Management in 2007³¹ as a result of Indonesia addressing deficiencies in the government's response to the Aceh earthquake and tsunami tragedy (2004) as well as Nias earthquake (2005) and Yogyakarta earthquake (2006)³². Subsequently after the enactment of this legislation, Indonesia reformed its disaster management bodies. From the National Disaster Response Coordinating Agency (BAKORNAS), National Disaster Management Agency (BNPB) was formed and at the provincial and district levels, the ad hoc SATKORLAK (Natural Disaster Management Implementation Coordination Unit) and SATLAK (Disaster Management Implementation Unit) structures was replaced by a permanent structure, National Agency for Regional Disaster Management (BPBD)³³. Australia then stepped into the picture by examining the handling, funding, and general management of BNPB and BPBD, in which Australia stated that 388 out of 491 BPBDs that were formed at that time had problems financially because they are extremely dependent on the regional government's budget³⁴.

As a result, the government needed assistance from other nations with more modern disaster management systems and extensive experience dealing with large-scale disasters. This, too, provided an opportunity for Australia to develop bilateral ties with Indonesia. Australia could maintain the disaster cooperation alliance established under AIPRD (Australia-Indonesia cooperation for Reconstruction and Development) while helping in the recovery of Aceh following the 2004 Tsunami tragedy³⁵. Ultimately, the governments of Australia and Indonesia pursued a political commitment to develop the Indo-Australian region as a disaster-resilient zone with AIFDR.

³¹ *Strengthening Disaster Reporting This Disaster Risk Reduction Month op. cit.*

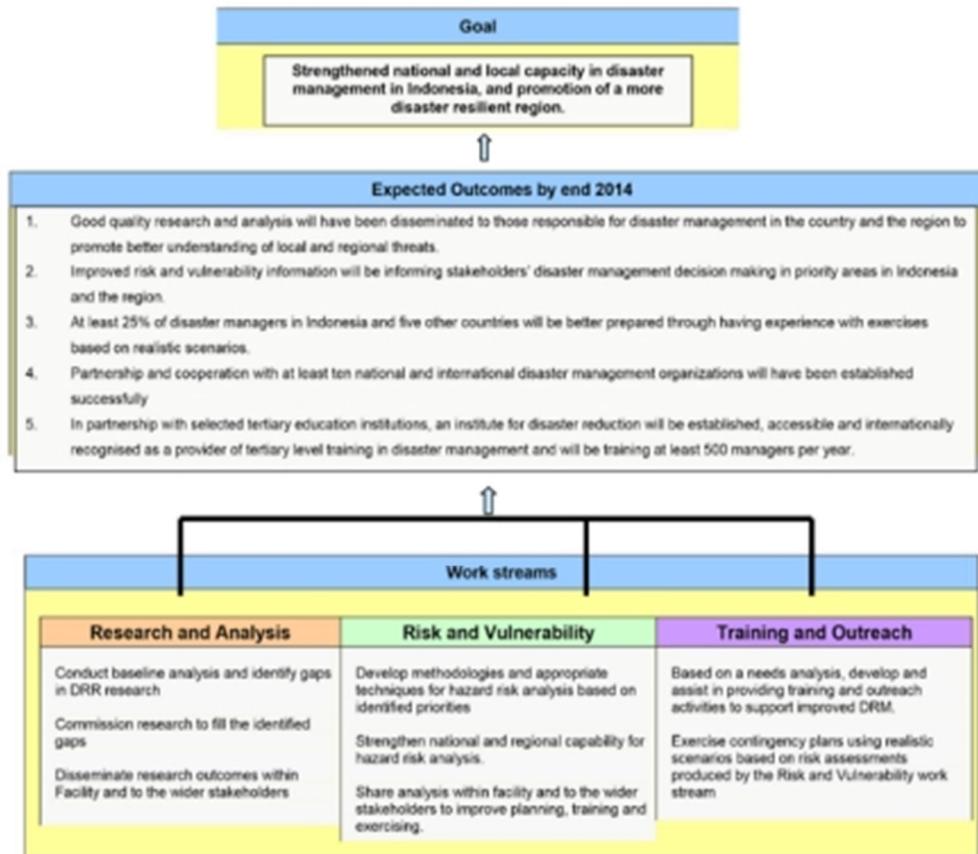
³² Syugiarto: "Disaster Management System in Indonesia", *Sumatra Journal of Disaster, Geography and Geography Education*, Vol. 5, n° 2 (December 2021), pp. 87–96.

³³ Putri, Arum Sutrisni: "BNPB: Sejarah, Perubahan Nama, Visi Misi, Tugas Dan Fungsi", *Kompas*, 3 January 2020

³⁴ Badan Nasional Penanggulangan Bencana, *op.cit.*

³⁵ *Kemitraan Australia Indonesia Untuk Rekonstruksi Dan Pembangunan: Pemulihan Pasca Bencana Di Aceh Dan Nias (2005–08)*, at https://www.dfat.gov.au/sites/default/files/AIPRD_aceh_recovery_bahasa.pdf.

Figure 1: Objectives and Framework of AIFDR



Source: Investment Design Australia-Indonesia Partnership in Disaster Risk Management

The AIFDR is multilayered in its politics. Australia and Indonesia recognize regional deficiencies in coordination, mitigation, and disaster management readiness, while Indonesia wishes to strengthen its capabilities to manage large-scale disaster response. The creation of AIFDR is directly proportionate to Indonesia's objective to develop the disaster management system based on the enactment of UU No 24 of 2007. Investment in science was central to AIFDR's program logic. According to the investment plan, Indonesia must have access to reliable world-class hazard data in order to enhance disaster risk reduction operations without much difficulty³⁶. The objectives of AIFDR in Indonesia are divided into three, consisted of the objective to assist in the implementation of the new Disaster Management UU 24/2007, building the capability for impact assessment and use Indonesia's expertise in the area, and support the emerging BNPB position in the regional and international disaster management sector³⁷. AIFDR also provide funding of \$84,000,000 through AusAID, an Australian government body to support foreign nations' development³⁸.

During more or less six years of the cooperation between Australia and Indonesia with the AIFDR program, from 2009 to 2015, the program has yielded mainly two outcomes in the

³⁶ *Investment Design Australia-Indonesia Partnership in Disaster Risk Management*, p. 5 at <https://apo.org.au/sites/default/files/2020-02/apo-nid214691-1276741.pdf>.

³⁷ Department of Foreign Affairs and Trade (Australia), *op.cit.* p. 7.

³⁸ Department of Foreign Affairs and Trade (Australia), *op. cit* p. 14.



national scale and one outcome in the regional scale, ranging from technologic assistance to topography of disaster points.³⁹

4.1 The InaSAFE Software System

One of the AIFDR's significant contribution is The InaSAFE Software System, which has been developed since 2011 by BNPB with assistance from AIFDR. The InaSAFE Software System was created with aim to facilitate BNPB and BPBD as government's disaster management bodies so that they are more readily available and easily accessed by the Indonesian public which will encourage alert towards natural disaster and achieve the AIFDR goal⁴⁰.

Software-based natural disaster management was one of the focuses of AIFDR program in its Risk and Vulnerability aspect in facing natural disaster as Indonesia did not have a software-based natural disaster management program⁴¹. InaSAFE, short for Indonesia Scenario Assessment for Emergency, was then established in 2012 aided by World Bank, AIFDR, Geoscience Australia, and BNPB. InaSAFE generates realistic scenarios and risk of natural disaster based on technical and social data. InaSAFE provides solution to give information on the possible effects of natural disaster by combining data from scientists, local governments, and the people so that authority can calculate the risks and create better emergency disaster plans⁴².

InaSAFE can be used to measure an area's vulnerability to tsunamis, floods, earthquakes, and volcanoes. However, InaSAFE still requires scientific danger data from government technical institutes or universities from its users⁴³. Beside that, users can employ risk traces from earlier instances of disaster. Users should also be able to obtain exposure statistics, as well as count the people, buildings, or roads and bridges. Population exposure data in a raster format must be received from the national demographic agency or WorldPop. WorldPop is a free and open population statistic source with high resolution and accuracy for nearly all of Africa, Asia, and America⁴⁴.

InaSAFE shows the number of buildings damaged and categorizes them by building type for assessment of impact on infrastructure. Another purpose of InaSAFE is to map which roads affected by catastrophes. The government can utilize this feature to determine which road networks in disaster response circumstances that can or cannot be used for evacuation of impacted persons or distribute relief supplies⁴⁵. Other than showing damaged infrastructure, InaSAFE generates a report based on age and gender, and may aggregate data with administrative constraints⁴⁶. Based on Head Regulation (PERKA) BNPB, InaSAFE may also compute the minimal needs for supporting the impacted area with aid. However, InaSAFE also allows customers to adapt aid needed based on estimates of in-site requirements⁴⁷.

³⁹ *Ibid.*

⁴⁰ *New Free and Publically Available Tool Keeps Indonesia One Step Ahead of Disaster* at https://indonesia.embassy.gov.au/jakt/MRJI2_004.html

⁴¹ Darvill and Roberts. *op. cit.*

⁴² *Tentang Proyek InaSAFE*, at <http://docs.inasafe.org/id/training/socialisation/introduction.html#about-the-project-name-project>

⁴³ *Ibid.*

⁴⁴ Pranantyo, Fadmastuti, and Chandra, *op. cit.*

⁴⁵ *Ibid.*

⁴⁶ Pranantyo, Fadmastuti, and Chandra, *op. cit.* p. 6.

⁴⁷ *Menjalankan InaSAFE Dasar*, at http://docs.inasafe.org/id/training/socialisation/run_basic_inasafe.html.



4.2 Earthquake Map of Indonesia

Earthquake map is an important component of disaster management in every country; practically every country has earthquake maps or natural disaster hazard maps⁴⁸. An earthquake map is a map that displays the number of the acceleration of the soil foundation as a result of the earthquake and its potential to damage the structures we create. This map shows the outcome of a probability analysis of seismic event data in certain locations⁴⁹. This can be categorized as event data. Existing earthquake data are processed and studied to generate probabilities of future earthquakes⁵⁰.

Earthquake maps in one country are never the same as earthquake maps in another. This occurs because the seismicity of one location differs from that of other regions. Furthermore, techniques for studying earthquake features differ based on the object and subject, and earthquake probability analysis changes the form of the earthquake map. As a result, even if Indonesian and Japan are both earthquake-prone zones, their earthquake maps will be vastly different.

In 1983, the map of maximum earthquake acceleration in Indonesia's bedrock was utilized for planning regulations via PPTI-UG (Indonesian Earthquake Resistant Planning for Buildings). This first earthquake map is the outcome of a study conducted by Beca Carter in collaboration with Indonesia and New Zealand⁵¹. Earthquake Resilience Planning Procedures for Building, SNI 03-1726-2002 was issued in 2002, updating PPTI-UG 1983. In SNI 2002, earthquake maps are used to determine the estimated earthquake load. Since the publication of SNI 03-1726-2002, several major earthquakes in Indonesia have occurred with magnitudes larger than the previously projected maximum, including the Aceh Earthquake (2004) and the Nias Earthquake (2005)⁵². The issue comes down to determining if the existing earthquake map is still relevant or if it is urgently necessary to improve it immediately. As technology advances, earthquake maps may be updated/revised to offer more current and accurate information.

Since 2006, formal initiatives to enhance Indonesia's earthquake map have been underway. The Department of Public Works spearheaded this initiative, which was supported by ITB, LIPI, BMKG, and other construction-related professional groups. This work was also made possible by partnership with the United States Geological Survey (USGS)⁵³. In order to perfect the Indonesian earthquake zoning map and combine diverse scientific information in the field of earthquake zoning, the Indonesian Earthquake Zoning Map Team was founded in 2009, and probabilistic seismic hazard analysis was incorporated. This team includes specialists in all elements of earthquake geology, seismology, tomography, crustal deformation, geotechnical earthquakes, and building earthquake structures in integrated research using a probabilistic method⁵⁴.

Since the BAKORNAS era until the formation of the BNPB through UU 24 of 2007, the absence of harmonization in the main tasks and functions between government agencies

⁴⁸ Country Report Indonesia: Natural Disaster Risk Assessment and Area Business Continuity Plan Formulation for Industrial Agglomerated Areas in the ASEAN Region at <https://openjicareport.jica.go.jp/pdf/1000023394.pdf>.

⁴⁹ Ibid.

⁵⁰ Tim Revisi Peta Gempa (2010): *Peta Hazard Gempa Indonesia 2010 Sebagai Acuan Dasar Perencanaan Dan Perancangan Infrastruktur Tahan Gempa*, Jakarta, Kementerian Pekerjaan Umum.

⁵¹ Hollings, Beca Carter and Ferner Ltd (1979): *Indonesian Earthquake Study, New Zealand Bilateral Assistance Programme to Indonesia*, Wellington, N.Z.

⁵² *Investment Design Australia-Indonesia Partnership in Disaster Risk Management*, op. cit..

⁵³ Masyhur, Irsyam et alia (2010): "Ringkasan Hasil Studi Tim Revisi Peta Gempa Indonesia 2010." *Tim Revisi Peta Gempa Indonesia*, Bandung, Tim Revisi Gempa.

⁵⁴ Tim Revisi Peta Gempa Indonesia: 'Ringkasan Hasil Studi Tim Revisi Peta Gempa Indonesia 2010', Jakarta, Juli 2010.



(aside from the TNI and Basarnas) and disaster agencies in Indonesia has become an evaluation that is always present in every natural disaster event in Indonesia⁵⁵. In the aftermath of the 2009 earthquake in Padang, West Sumatra, international organizations such as the United Nations had to act not just as assistance givers but also as emergency response coordinators. This evidently demonstrates the BNPB's inability to carry out its primary function as the top command in national catastrophe management⁵⁶.

Preparation is important in disaster readiness, but harmonization and coordination amongst institutions is also needed to achieve it. Since the early 1990s, the Australian government has established harmonization and coordination across expert institutions in catastrophes, beginning with preparation, emergency response, and recovery⁵⁷; this system was an idea provided by AIFDR to be applied to Indonesia's disaster management system. The Ministry of Public Works and Housing organized and supported the development of the Indonesian Earthquake Map Team. The Indonesian Earthquake Map Team is also assisting and cooperating with AIFDR in updating the earthquake zone maps for Sumatra, Java, Nusa Tenggara, and Eastern Indonesia⁵⁸.

Until 2015, BNPB formalized a task force for updated seismic hazard maps via a memorandum of assignment (SK), so that BNPB was included in the Indonesian Earthquake Map Team, which was tasked with continuing to update the Seismic Hazard Map/Indonesian Earthquake Map in hopes that it remained updated with developments in ground movements and earth's tectonic plate conditions in Indonesia⁵⁹.

In 2017, the Ministry of Public Works and Housing began coordinating the organization and management of the National Earthquake Study Center (PuSGeN), which consists of a drafting team from the Ministry of Public Works and Housing, the Ministry of Energy and Mineral Resources, the Ministry of Research, Technology, and Higher Education, the Ministry of Transportation, the Agency Meteorology, Climatology, and Geophysics, the National Disaster Management Agency, the Indonesian Institute of Sciences, and Geospatial Indonesia⁶⁰. The participation of Geoscience Australia assistance in the PuSGeN working group to date demonstrates AIFDR's achievement in laying the groundwork for Australian Government cooperation in the development of Natural Disaster Management in Indonesia⁶¹.

4.3 Makassar Flood Contingency Plan 2014

Pre-disaster disaster management includes disaster management planning, disaster risk reduction, disaster prevention, integration in planning development, disaster risk analysis requirements, implementation and enforcement of spatial plans, education and training, and

⁵⁵ Anggono, Bayu Dwi: "Harmonisasi Peraturan Perundang-Undangan Di Bidang Penanggulangan Bencana", *Mimbar Hukum-Fakultas Hukum Universitas Gadjah Mada* Vol. 22, No. 2, (June 2010), pp. 373–90.

⁵⁶ Perkasa, Anhal Mulya: "Analisis Mekanisme Pengkoordinasian Bantuan Gempa Kota Padang Provinsi Sumatera Barat", *Jurnal Administrasi Publik Dan Bisnis* Vol. 1, n° 2 (2019), pp. 38-55.

⁵⁷ *Legal Preparedness for International Disaster Response in Australia* at https://disasterlaw.ifrc.org/sites/default/files/media/disaster_law/2020-09/193900-australian-cs-EN.pdf.

⁵⁸ Masyhur *op. cit.*

⁵⁹ Peta Sumber Dan Bahaya Gempa Indonesia Tahun 2017 *Kementerian Pembangunan Umum* at <http://puskim.pu.go.id/wp-content/uploads/2018/02/BUKU-PETA-GEMPA-2017.pdf>

⁶⁰ *Ibid.*

⁶¹ Jakab, Matthew and Robinson, David: "Cooperation on the Disaster Risk Management Program in Indonesia", *Geoscience Australia; Department of Foreign Affairs and Trade*, Vol. 1, n. d. pp. 1-32, at <https://www.dfat.gov.au/sites/default/files/indonesia-disaster-risk-management-drm-final-completion-report.pdf>.



disaster management technical standard requirements⁶². In the pre-disaster stage, one of the aspects of disaster management planning is Contingency Planning.

A contingency is a circumstance or situation that is predicted to happen in the near future yet might not happen. Contingency planning is the process of identifying and developing strategies in response to contingent or unpredictable events. If the projected circumstance does not materialize, a contingency plan may not always be implemented⁶³.

The planning procedure involves an ensemble of people or groups who collaborate constantly to establish and agree on common goals, define roles, and actions that each participant must do. Contingency plans are organized at various levels⁶⁴, as it is needed for quick and effective disaster response. If there is no contingency preparation a significant amount of time would be lost in the first several days of responding to an emergency, which is the most crucial time of making quick rescue missions. Contingency plan strengthens disaster management organization's capabilities and should serve as the foundation for operating emergency response plans⁶⁵.

Every year, Makassar City in South Sulawesi Province endures a flood cycle. In 2014, the Makassar Disaster Management Agency (BPBD Makassar) developed a flood contingency plan for the city of Makassar⁶⁶. This effort is supported by AIFDR. The method of developing contingency plans and holding workshops on contingency plan scenario training, which is separated into nine stages, is consistent with AIFDR's goals for enhancing contingency planning in Indonesia. This effort is also a carefully designed AIFDR work program for two of AIFDR's three primary work streams, namely Vulnerability and Training and Outreach⁶⁷. The strategy was developed with the help of fifty representatives. This includes the AIFDR Team, BPBD Makassar City, BPBD South Sulawesi Province, SAR National Agency (BASARNAS), Indonesian Red Cross, Fire Department, Development Planning Agency Province (Bappeda), Health Service, Education Service, POLRI, and several NGOs⁶⁸. The heads of organizations and groups reportedly work effectively together through all six stages of the process, including socialization, data gathering, training and seminars on emergency plan formulation, public hearings, and finalization of written contingency plan materials⁶⁹.

This sequence of operations resulted in the creation of a Contingency Plan Document for Flood in Makassar City, which was officially acknowledged by Makassar Mayor Moh Ramdhan Pomanto on November 17, 2014⁷⁰. This document is crucial in order to prepare for anticipated natural catastrophes, particularly floods, and minimizing uncertainty through development scenarios and estimated emergency response needs. Furthermore, it is utilized as

⁶² *A Conceptual and Adaptable Model for Disaster Management in the Caribbean* at <https://www.paho.org/en/documents/conceptual-and-adaptable-model-disaster-management-caribbean>.

⁶³ Payne, Christopher F: "Contingency Plan Exercises", *Disaster Prevention and Management: An International Journal*, Vol. 8 n° 2 (1999), pp. 111-117.

⁶⁴ Myers, Kenneth N (1999): *Manager's Guide to Contingency Planning for Disasters: Protecting Vital Facilities and Critical Operations*, New York, Wiley.

⁶⁵ Rothstein, Philip Jan (2007): *Disaster Recovery Testing: Exercising Your Contingency Plan*, Brookfield, Connecticut, Rothstein Associate Inc.

⁶⁶ *Dokumen Rencana Kontijensi Banjir* at <https://bpbd.sulselprov.go.id/wp-content/uploads/2021/11/Renkonbanir-Sulsel-2017-2020-dari-andir.pdf>.

⁶⁷ Department of Foreign Affairs and Trade (Australia) *op. cit.*

⁶⁸ South Sulawesi Province Government, *op. cit.* p. 70.

⁶⁹ South Sulawesi Province Government, *op. cit.* p. 30.

⁷⁰ Fatir, Oleh Darwin: 'BPBD-AIFDR Bahas Kontijensi Banjir', *Antara News Sulawesi Selatan*, 20 March 2014, at <https://makassar.antaraneews.com/berita/53831/bpbd-aifdr-bahas-kontijensi-banjir>



a significant source of information for determining policies and strategies to ensure the implementation of an effective, efficient, and well-coordinated flood response⁷¹.

The scenario presented in the document was generated using *geoprocess* analysis in QGIS, and InaSAFE, the latter being the outcome of collaboration between BNPB and AIFDR. The analysis of InaSAFE creates potentially affected building scenario and simulations regarding people that may need to be evacuated, as well as the minimum support required to evacuate the population to safety⁷². Geoprocessing analysis is used to determine the infrastructure and facilities affected impacts⁷³, such as land use, infrastructure, economic assets such as markets, supermarkets, industrial buildings, warehouses, hotels, offices, and ports, social and cultural assets such as educational institutions, places of worship, health facilities, government buildings, nursing homes, and landfill, and security assets such as police and security posts.

Evacuation shelter recommendations are based on field surveys and interviews with informants, regional government heads, and citizens in each sub-district impacted by floods. Evacuation routes are developed by a field survey, interviews with impacted people and other source persons. Identification of the latest evacuation routes is created by BPBD Makassar as a reference to create the most recent evacuation routes, along with identification of areas that are not impacted by floods or safe areas⁷⁴.

With the effectiveness of its manufacturing and training efforts for the Makassar City flood contingency plan in 2014, AIFDR won recognition from the Makassar City Government and BPBD Makassar City for allocating its program to assist Makassar City in its preparation. The contingency plan is also seen to be extremely relevant and effective to handle Makassar City's yearly floods⁷⁵.

4.4 Disaster Management Continuity

Indonesia and Australia's cooperation in mitigating natural disasters did not end in 2015 after the establishment of AIFDR. AIFDR's commitment with BNPB and BPBD continued, as agreed upon in AIFDR Memorandum on March 2010⁷⁶. The continuation of InaSAFE is also used to further develop Rencana Induk Sistem Komunikasi Bencana or Masterplan for Disaster Communication Systems, which still involve experts and scientists from Australia, which shows the serious effort in maintaining the cooperation and foundation built on AIFDR⁷⁷. Throughout the years, DFAT as the Australian government's body of funding in international affairs have continuously work with BNPB to conduct skill trainings, including one held in West Nusa Tenggara, a province impacted by the 2018 Earthquake⁷⁸.

5. Conclusion

Indonesia is a country that sits on a precarious position, on top of the meeting of three tectonic plates and on the Ring of Fire. This puts Indonesia's citizens constantly exposed to the often-

⁷¹ Badan Penanggulangan Bencana Daerah, *Rencana Kontinjensi Bencana Banjir Kota Makassar*, Makassar, 2014.

⁷² Pranantyo, Fadmastuti, and Chandra, *op. cit.*, p. 5.

⁷³ *What Is Geoprocessing?* at

<https://desktop.arcgis.com/en/arcmap/latest/analyze/main/what-is-geoprocessing.htm>.

⁷⁴ Badan Penanggulangan Bencana Daerah, *op. cit.*, p. 49.

⁷⁵ Fatir, *op. cit.*

⁷⁶ Badan Nasional Penanggulangan Bencana.

⁷⁷ BNPB (National Disaster Management Authority), *Rencana Induk Sistem Komunikasi Bencana 2015-2019*, 2015.

⁷⁸ BNPB (National Disaster Management Authority), 'Implementasi Pascakursus Kerja Sama BNPB Dan DFAT Australia', *BNPB*, 2023, at <https://www.bnpb.go.id/berita/implementasi-pascakursus-kerja-sama-bnpb-dan-dfat-australia>.



unpredictable danger of natural disaster. After the mid-2000s earthquakes that struck various island and cities, the government of Indonesia responded with ratifying the Hyogo Framework for Action and enacting a new legislation (UU No 24/2007) to ensure the safety of its people and to minimize the damage of infrastructure and financial loss. This new legislation seeded the creation of BNPB and BPBD.

Indonesia has several duties to enhance the system and institutions that administer it, including a natural disaster management system and new institutions (BNPB and BPBD). By stepping in to take part in Indonesia's natural disaster management system, the Australian Government has developed a vision and objective that is consistent with Indonesia's efforts to build a capable natural disaster management in the Asia Pacific region. Subsequently, a political commitment was agreed upon that resulted in a collaboration known as the Australia Indonesia Facility for Disaster Reduction (AIFDR) between the Indonesian and Australian governments at the Asia-Pacific Economic Cooperation (APEC) meeting in 2008.

The Australian Government distributed funding totaling \$84,000,000 Australian dollars in partnership with AIFDR, which were channeled through AusAID Indonesia and officially launched in Jakarta in April 2009. AIFDR's mission is to develop national and local disaster management capacity in Indonesia while assisting in creating a more disaster-resilient Asia Pacific region. It has three primary work program focuses: Research and Analysis, Risks and Vulnerabilities, and Training and Outreach. To carry out these three work program subjects, AIFDR drew in disaster specialists from Geoscience Australia who have expertise assisting the Australian Government in dealing with natural catastrophes.

Since 2011, AIFDR and BNPB have designed a natural disaster management system based on InaSAFE (Indonesia Scenario Assessment for Emergency) software, which is a breakthrough in natural disaster management in Indonesia, where this software can help BNPB and BPBD, and Indonesian population in natural disaster readiness. AIFDR also assists BNPB in cooperating with the Indonesian Earthquake Team, which is made up of experts from several scientific institutes. AIFDR also worked with the Indonesian Earthquake Team to improve the 2009 Indonesian Earthquake Map by enlisting the help of professionals from the Australian Geosciences.

At the regional level, AIFDR implements its initiatives to support BPBD in establishing natural disaster countermeasures. During the AIFDR Cooperation, AIFDR assisted in the development of disaster response plans across several regions, in collaboration with BPBD and regional governments in each region. As demonstrated by the effective development of the Makassar City Flood Contingency Plan in 2014. AIFDR aided BPBD, Makassar City Government, and other regional institutions in developing contingency plans and conducting training on how to implement these plans through this initiative.

AIFDR focuses on providing facilitation assistance and collaborating with BNPB and BPBD as new institutions with permanent authority in disaster management in Indonesia. AIFDR has also succeeded in developing human resource capacity and performance systems within BNPB and BPBD to build and develop an Indonesian disaster management system. The Australian Government's efforts to improve the quality of Indonesia's disaster management system do not end with AIFDR collaboration. To this day, the Australian and Indonesian governments are still working together to manage disasters.



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