

Information Gaps and Challenges in Indonesian Disaster Early Warning System

○Haris RAHADIANTO, Subhajyoti SAMADDAR, Hirokazu TATANO

Indonesia is one of the countries that have great number of disaster occurrences and hazard threat because it is located in not only between three tectonic plates but also in the Ring of Fire path that resulted in various disaster such as like earthquakes, Tsunamis, volcanic eruptions, and many more. Its unique geographic environments and disaster frequency make Indonesia vulnerable to disaster, which sadly every time disaster occurred, the number of victim losses and property damages are big and devastating. This alarming situation is also worsened by the occurrence pattern relatively tend to increase, based on analysis from disaster frequencies that happened from 1994 – 2018.

The recent proofs of that could be seen in two latest great disasters that struck in sequence within a month last year, Lombok Earthquake and Palu-Donggala Earthquake and Tsunami. Both suffered calamitous aftermath which affected more than 20,000 people and 60,000 people, respectively. The high number of victims are mostly caused by the misinformed people about the upcoming disasters and the lack of infrastructure safety mechanism which resulted in inability of its society to grasp disaster risk awareness and perceive the implementation of disaster management process. It worsened by the Tsunami that happened in Sunda Strait caused by Mt. Anak Krakatau's eruption in the end of 2018, where there was no warning at all at the times where many people gathered in the shore and swept away by devastating wave

An important part of a holistic approach to risk management of natural hazards is the setup of early warning systems. Recent studies have illustrated that early warning systems can have significant benefits exceeding their development and maintenance cost. Early warning systems protect the public by combining scientific monitoring and detection systems with social design factors and components to notify the risk at public.

From an information perspective, early warning systems need to satisfy at least the following user information requirements, such as speed of communication; reachability; and information quality. Apart from that, early warning system is the main part of disseminating effective risk communication that lead to faster evacuation and reducing number of losses and damages. Effective communication, or the absence of it, may have a major bearing on how well people are prepared for a disaster.

Looking on how devastating the last two major disaster events, many experts concluded that Indonesian government must envisage more comprehensive disaster risk communication strategies in order to build endurance and resilience towards disaster, which is must be supported by all stakeholders. Furthermore, the science-based risk communication plan should be encouraged for empowering its people to be resilient, backed by media and scholars to systematically advertise it using sophisticated but simple ways.

The current early warning system in Indonesia is mainly refer to local government as the bearer of authority and responsibility of early warning communication in Indonesia. Local government are responsible for issuing immediate public announcements containing clear directions and instructions to help the inhabitants of, and visitors to, an area react quickly and appropriately to a disaster threat. Local government receive the report from the Meteorological, Climatology, and Geology Agency (BMKG), the Center for Volcanology and Geological Hazard Mitigation (PVMBG), and other related institutions that responsible hazard detection, then assisted by the National Disaster Management Authority (BNPB) in order to make decision regarding early warning and evacuation order to threatened civilians.

It also already employed sophisticated system for providing in-time information regarding upcoming disaster, such as the development of Indonesia Tsunami Early Warning System (InaTEWS) as official tsunami early warning system and Merapi monitoring system that includes cellular based real-time monitoring of water level, rainfall radar, and *lahar* (debris) sensors. In regard of broadcasting and dissemination early warning information, national and local television and radio station, whether it is commercial or public, are required to broadcast disaster information and early warnings and guidance from local government. Television and radio stations form the actor in the early warning communication chain that has direct, rapid, and nationwide access to the public. The latest implementation also incorporated SMS, Email, and mobile apps for disseminating threat-related information to the people directly.

This paper aims to identify the existing problems lies in the implementation of early warning system by Indonesian government. This system is used to inform and communicate the people about the upcoming disaster risk using several methods that have been applied for various disasters and several years now, but the late events provided there were lack of information needed in order to save more lives and reduce the loss. This paper investigates around 56 documents from journals, published articles, news, and government reports in order to get finding if there are such information gaps in the current implementation of early warning system, such as incomplete messages, misleading guidance, and even absence of information. The literature review was conducted to examine arising problems from society in general, former disaster victims, and researchers who work on the relationship of disaster early warning and the response capabilities.

In the end, it consists of 23 news articles (1 article from local site, 3 articles from international news portals, 1 special featured article from international news portal, 18 articles from reputable national news sources), 21 publications in Indonesian Language (Bahasa Indonesia), 3 international publications, 1 conference paper, 1 master thesis report, 5 reports, and 2 guidelines books. Both sources whether from news articles and scientific journals are hopefully given the real condition about the existing problems terms of information dissemination in relation between early warning system and affected people in Indonesia.