The Resilience Index towards Natural Disaster in Indonesia

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Abstract:
Indonesia is considered as the laboratory for disaster as various kinds of disaster (natural or man-made) have happened in the country. According to the Indonesian National Disaster Management Authority (BNPB), in 2015 alone, 1,728 disaster events have occurred in Indonesia (BNPB, 2016), with forest fire as the most notable event in that year. Disaster affects all elements of community in the area, and the ability and time required to recover from it depends largely on the resilience of the area itself. The United Nations Office for Disaster Risk Reduction (UNISDR) defines resilience as the ability of a system, community or society exposed to hazards to resist, absorb, accommodate to and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions. This definition suggests that there are two main components of resilience towards disaster, namely, preparedness and vulnerability just as also suggested by Simpson (2006) and Viverita et al. (2014). Preparedness refers to the capacity to handle disaster (Simpson, 2006), while vulnerability is defined as the potential for loss (Cutter, 1996). We have developed a resilience index for disaster-prone areas in Indonesia towards natural disaster (Kusumastuti et al., 2014). The index is developed based on literature review, in-depth interviews (IDIs) and focus group discussions (FGDs) with representatives from several government institutions and non-government organizations (NGOs) that are usually involved in disaster management in Indonesia. The resilience index is proposed as the ratio between preparedness and vulnerability of the area. The dimensions of preparedness are namely social, community capacity, economic, institutional, infrastructure. Similar dimensions applied for the vulnerability with additional dimension of hazard. We use composite indicator to determine the preparedness and vulnerability scores as in previous literature. The preparedness score (PI) is calculated as the sum of weighted score of all dimensions' scores (PD), whereas the dimension score is calculated as the sum of weighted of all sub-dimensions' scores (PS). Lastly, the sub-dimension score is calculated as the average score of its indicators. We use pair-wise comparisons from AHP (Saaty, 1980) to determine the weights of all dimensions and sub-dimensions of preparedness and vulnerability, based on in-depth interviews with eight experts in disaster management in Indonesia in 2013. The analysis shows that for preparedness, community capacity has the highest weight, followed by institutional, economics, infrastructure, and social, while for vulnerability, social dimension has the highest weight, followed by hazard, infrastructure, institutional, community capacity, and economics. The results indicate that preparedness can be increased and vulnerability of the area can be decreased by improving the community competence and the understanding of disaster risk and mitigation through regular education and socialization.