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PRICING RESIDENTIAL EARTHQUAKE INSURANCE IN INDONESIA

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Abstract: Adaptive Social Protection (ASP) is a framework that integrates social protection, disaster risk reduction, and climate change adaptation to enhance resilience against shocks and hazards. As a country vulnerable to earthquakes, Indonesia faces threats of losses due to seismic disasters. The national budget available to cover these losses can only address 13.6% of the total disaster-related losses. This study proposes an earthquake insurance scheme to protect all residences in Indonesia as part of the ASP framework, followed by the calculation of premium rates for this insurance scheme. This study utilizes the built-in OpenQuake calculator known as the probabilistic event-based risk calculator to simulate annual earthquake losses over a period of 10,000 years. The negative binomial distribution and the Pareto IV distribution are assessed as the most optimal models in modeling frequency and severity through distribution fitting. The application of collective risk models and the principle of pure premium results in a pure premium rate of 0.3994073 ‰. This pure premium rate can serve as a starting point in the establishment of comprehensive residential earthquake insurance in Indonesia.

1. INTRODUCTION

The concept of adaptive social protection (ASP) is a response to the multidimensional risks encountered by the poor and vulnerable population (Arnall et al., 2010). ASP integrates elements of social protection (SP), disaster risk reduction (DRR), and climate change adaptation (CCA) (Davies et al., 2008). As part of ASP, DRR aims to prepare communities for hazards before events occur (Davies et al., 2008). Disaster risk financing strategies represent a shift in perspective by viewing natural disasters not as unpredictable crises but as events with impacts that can be mitigated. (Bowen et al., 2020).

The Sendai Framework for Disaster Risk Reduction (SFDRR) 2015-2030 assesses disaster risk transfer and insurance as important instruments for reducing financial impacts on governments and communities (UNISDR, 2015). Insurance integrated into social protection is considered capable of protecting vulnerable households from falling into the poverty trap due to significant shocks (Jensen et al., 2017), as impacts such as asset loss during natural disasters can push the poor into a downward spiral of deepening poverty (Davies et al., 2008).