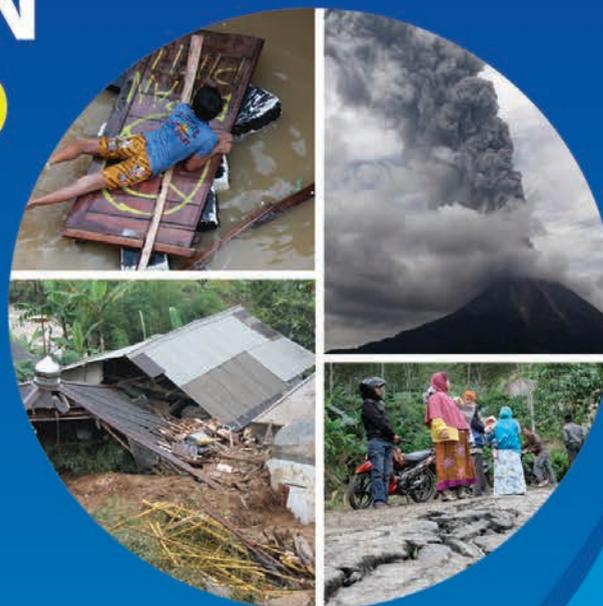# POPULATION EXPOSED TO NATURAL HAZARDS

a Study Based on the 2010 Population Census

BNPB

UNFPA

BADAN PUSAT STATISTIK

Jakarta, 2015

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POPULATION EXPOSED TO NATURAL HAZARDS

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Joint Foreword

Partnership is a very positive step to synergize resources from various parties. The National Disaster Management Agency (BNPB) and Statistics Indonesia (BPS), under the auspices of UNFPA, the United Nations Population Fund heve colaborated in a partnership to develop this thematic study, "Populations Exposed to Natural Hazards". a study based on the 2010 population census in Indonesia and BNPB's 2011 Disaster Risk Assessment.

The study is expected to provide readers with impotant information as well as provide policy-makers with reference material to support evidence-based policy-making on disaster management and development planning.

BNPB and BPS believe this study is very important in providing relevant information on the threats of the disasters towards the population in Indonesia, particularly vulnerable groups. These groups comprise young children (under-five children), the elderly and people with disabilities.

BNPB and BPS, again with the support of UNFPA, have previously integrated population data into the Indonesian Disaster Data and Information system. Further collaboration with government ministries and agencies will hopefully lead to the development of national guidelines on using data for disaster management programmes.

We wish to express our deep appreciation for UNFPA's facilitation in making this collaboration possible. We look forward to making the most of the results of this thematic study, as we seek to bring our respective strengths to the important task of responding to natural disaster hazards in Indonesia.

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Preface

One important achievement of the cooperation between the National Disaster Management Agency (BNPB) and BPS-Statistics Indonesia has been the successful integration of population data into the Indonesian Disaster Data and Information (DIBI) system, with technical support from UNFPA, the United Nations Population Fund. UNFPA is committed to continue providing technical support for the further integration and use of population data for disaster management in Indonesia.

The integration of population and disaster data has enabled BNPB to assess the numbers of vulnerable groups and populations in disaster-prone areas. One useful product of this integration has been the compilation of this book, with a focus on populations exposed to the hazards of natural disasters.

This book, titled Populations Exposed to Natural Hazards, a study based on the 2010 population census in Indonesia contains the results of a study on the numbers of vulnerable groups and populations that are exposed to six types of high and medium level hazards in each of Indonesia's 33 provinces. The types of hazards assessed include earthquakes, tsunamis, landslides, volcanic eruptions, floods, extreme waves and erosion. The groups and populations identified as vulnerable to disasters include under-five children, the elderly (60+), and persons with disabilities.

The study in this book shows that more than 97% of Indonesia's total population live in disaster-prone areas. Of the six types of hazards discussed in the book, earthquakes pose a high or medium level hazard to the greatest number of people, at more than 148 million people, or 62.4% of Indonesia's total population.

UNFPA is proud to have contributed to the preparation of this book by providing technical assistance to BNPB for the calculation of the numbers of vulnerable groups and populations that are exposed to natural hazards.

I hope this book can provide timely and accurate information on vulnerable groups and populations exposed to natural hazards so that it can be used as a reference by all humanitarian actors, including both government and non-government actors, in policy making and programme activities for disaster risk management.

Jakarta, June 2015

Jose Ferraris
UNFPA Representative in Indonesia

Executive Summary

The Indonesian archipelago is located in a region that is very prone to the threat of natural disasters. The country with a population of over 237 million people counted in the 2010 Population Cencus, is subject to devastation from geological and hydro-meteorological hazards caused by its position and geographic conditions.

Acknowledging this background, the National Disaster Management Agency (BNPB), Statistics Indonesia (BPS), and UNFPA, the United Nations Population Fund, have collaborated to publish this handbook in an effort to enrich the study of disaster relief in Indonesia. This study will improve public knowledge regarding exposure to the hazards as well as encouraging a more comprehensive understanding of disaster related development planning at the local level.

This study has drawn on the data from BNPB's 2011 Disaster Risks Assesment and BPS's 2010 Population Census. The threats include the geological hazards earthquake, tsunami, and volcanic eruption, and hydro-meteorological hazards floods, landslides, storms, and extreme waves and abrasion. BNPB categorizes the hazards in low, medium, and high levels, however, only the medium and high categories are used in this study.

To develop the modeling on the population exposed to these risks, the study used geographic information systems and grid analysis techniques. The grid analysis displays spatial data in several cells with certain sizes. Each of these cells contains numbers that represent a value, and the parameters in the analysis use the number of population exposed based on gender and vulnerable groups. The parameters refer to the definitions used by BPS; that is, gender refers to men and women, and vulnerable groups refer to under five children, the elderly, and persons with disability.

The study of population exposed to the danger of natural disasters shows that over 97% of inhabitants of Indonesia are living in the areas prone to disasters. Out of the six types of disasters, earthquake is the hazard with the largest population exposed in the high- and medium level categories. The total population exposed is over 148 million or 62.4% of the total population of Indonesia. This is a large number considering that 92.2 million hectares or 48.5% of the total area of Indonesia is exposed high and medium levels of earthquake. Population exposure to other hazards includes tsunamis (4.2 million people), volcanic activity (3.9 million), floods (63.7 million), landslides (40.8 million), and extreme waves and abrasion (11.1 million).

In comparison to the total population exposed to the different hazards, tsunami and volcanic eruption show the lowest number, but data shows these disasters have significantly high impacts. Based on Indonesia Disaster Data and Information (DIBI)figures, the number of casualties due to tsunami during the period of 2000 - 2013 was 167,000 with the largest number being the event in Aceh in 2004. Volcanic eruption led to as many as 403 deaths during the same period, with the most casualties resulting from the Mount Merapi eruption in Central Java and Yogyakarta in 2010.

Other disasters that often strike in Indonesia are flood and landslides. More than 1,000 incidents are recorded in the period of 2000 - 2013, and large numbers of people have been exposed to both types of disasters. The percentages of population exposed to high and medium level floods and landslides are 26.8% and 17.2% of the total population of Indonesia, respectively.

Efforts of mainstreaming disaster risk reduction are very important in every step of development both in the national and local levels. At the national level, Ministry of National Development Planning (BAPPENAS) and BNPB have incorporated disaster risk reduction into the Medium Term National Development Plan 2015-2019. This study shows the areas and the number of population exposed to risks from hazards and natural disaster. It is important for people who live in particular ares prone to these risks to be aware of the environment around their residing place. They must be capable of adapting to any potential hazards that might occur. The results of this study may help to the information on exposure to disasters to assist in informing the wider public about these risks, and assist stakeholders at all levels in planning for disaster risk reduction and response.