

EXECUTIVE SUMMARY

On May 27, an earthquake struck the very heartland of Indonesia, near the historic city of Yogyakarta. With its epicenter in the Indian Ocean at about 33 kilometers south of Bantul district, it measured 5.9 on the Richter Scale and lasted for 52 seconds. Because the earthquake was relatively shallow at 33 kilometers under ground, shaking on the surface was more intense than deeper earthquakes of the same magnitude, resulting in major devastation, in particular in the districts of Bantul in Yogyakarta Province and Klaten in Central Java Province.

The earthquake was the third major disaster to hit Indonesia within the past 18 months. In December 2004, a major earthquake followed by a tsunami devastated large parts of Aceh and the island of Nias in North Sumatra, and in March 2005, another major earthquake hit the island of Nias again. With Indonesia's more than 18,000 islands along the Pacific "ring of fire" of active volcanoes and tectonic faults, the recent disaster is a reminder of the natural perils facing this country.

Damage and Losses

Though the number of casualties was fortunately lower than comparable disasters, the damage and losses sustained, rank this earthquake among the most costly natural disasters in the developing world over the past ten years. A comprehensive analysis by a team of Indonesian Government and international experts estimate the total amount of damage and losses caused by the earthquake at Rp 29.1 trillion, or US\$ 3.1 billion. Total damage and losses are significantly higher than those caused by the tsunami in Sri Lanka, India and Thailand and are similar in scale to the earthquakes in Gujarat (2001) and in Pakistan (2005) (see Table 1).

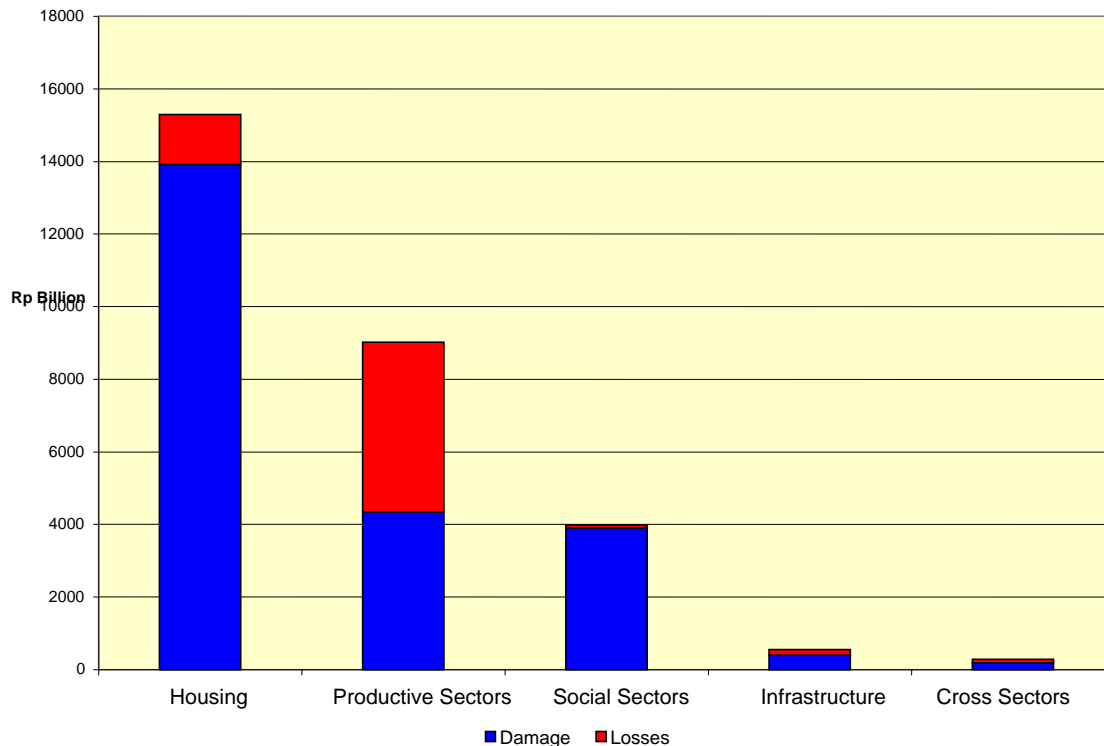
Table 1: International Comparison of Disasters

Country	Disaster event	Date	Number killed	Damage & losses (US\$ million)	Damage & losses (US\$ million, 2006 constant prices)
Turkey	Earthquake	Aug.17, 1999	17,127	8,500	10,281
<i>Indonesia (Aceh)</i>	<i>Tsunami</i>	<i>Dec. 26, 2004</i>	<i>165,708</i>	<i>4,450</i>	<i>4,747</i>
Honduras	Hurricane Mitch	Oct.25–Nov.8,1998	14,600	3,800	4,698
<i>Indonesia (Yogya-Central Java)</i>	<i>Earthquake</i>	<i>May 27, 2006</i>	<i>5,716</i>	<i>3,134</i>	<i>3,134</i>
India (Gujarat)	Earthquake	Jan. 26, 2001	20,005	2,600	2,958
Pakistan	Earthquake	Oct. 8, 2005	73,338	2,851	2,942
Thailand	Tsunami	Dec.26, 2004	8,345	2,198	2,345
Sri Lanka	Tsunami	Dec.26, 2004	35,399	1,454	1,551
India	Tsunami	Dec. 26, 2004	16,389	1,224	1,306

Sources: Asia Disaster Preparedness Center, Thailand; ECLAC, EM-DAT, World Bank

The damage was very heavily concentrated on housing and private sector buildings. Private homes were the hardest hit, accounting for more than half of the total damage and losses (Rp 15.3 trillion). Private sector buildings and productive assets also suffered heavy damage (estimated at Rp 9 trillion) and are expected to lose significant future revenues. This will have a particularly serious impact on small and medium sized enterprises, as the area was a key center of Indonesia's burgeoning small scale handicrafts industry. Damage to the social sectors, particularly health and education, are estimated at Rp 4 trillion. All other sectors, particularly infrastructure, had comparably smaller damage and losses (see figure 1), far below the infrastructure damage caused by the tsunami in Aceh and Nias.

Figure 1: Summary of Damage and Losses



Source: Estimates of Joint Assessment Team

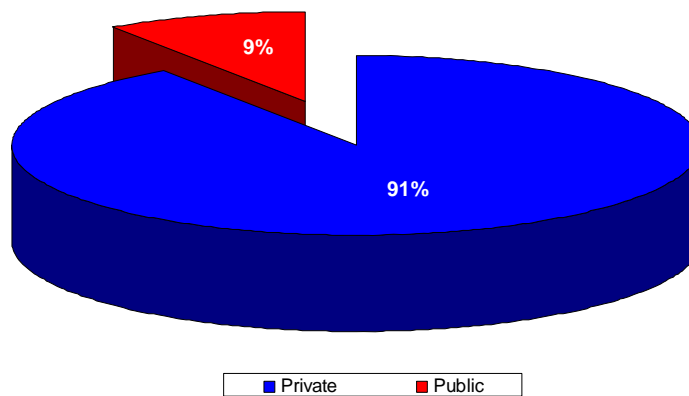
Key Sectoral Facts and Issues:

- **Housing damage and losses account for over 50% of the total.** An estimated 154,000 houses were completely destroyed and 260,000 houses suffered some damage. More houses will have to be replaced and repaired than in Aceh and Nias at a total cost of about 15% higher than the damage and loss estimate of the tsunami.
- **Over 650,000 workers were employed in sectors affected by the earthquake, with close to 90% of damage and losses concentrated in small and medium enterprises.** 30,000 enterprises were directly affected as well as through supply chain and other disruptions in intermediation. Unemployment is likely to rise. The restoration of livelihoods will be an urgent priority.

- **Social sectors also experienced significant damage.** Health and education were equally hard hit with more than Rp 1.5 trillion in damage and losses. Private sector health facilities (predominantly uninsured) suffered greater losses than the public sector.
- **Most of rural and urban infrastructure remained intact and suffered only small damages.** Transport and communications, energy and water supply and sanitation damage and losses are estimated at Rp 551 billion. At this level of damage, it is expected that infrastructure can be restored to its pre-disaster levels relatively quickly through existing Government agencies.

The damage and losses are predominantly private (see figure 2). This is a result of the high concentration of damage to private housing and small scale industry. This makes the earthquake in Yogyakarta and Central Java unique in comparison with other disasters and has important implications for the strategy of rebuilding and compensation.

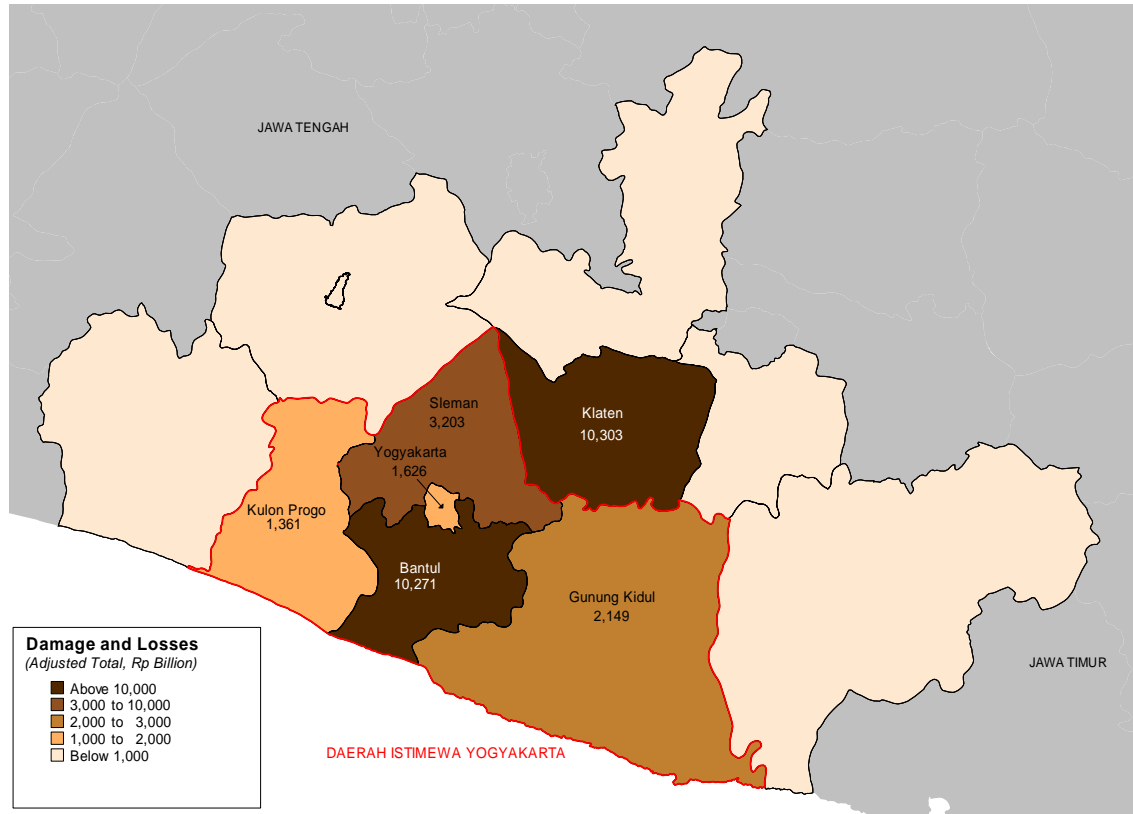
Figure 2: Composition of Damage and Losses: 91 % private



Source: Estimates of Joint Assessment Team

The impact of the disaster was highly concentrated in the districts of Bantul in Yogyakarta Province and Klaten in Central Java. Together Bantul and Klaten constitute more than 70% of the total damage and losses. The other major damaged areas include the City of Yogyakarta and three other rural districts in the province of Yogyakarta (see map 1). Klaten experienced the most severe aggregate damage, particularly in housing; Bantul suffered heavily from productive sector damage and losses, as well as housing damage.

Map 1: Geographic Distribution of Damage and Losses



Source: Estimates of Joint Assessment Team

Why are damage and losses so high?

The earthquake hit in Java, one of the most densely populated areas in the world. The six districts most affected by the earthquake have a population of about 4.5 million. The districts of Bantul and Klaten – with an average population density of over 1,600 – rank among the top ten most densely populated districts in Indonesia.

The shallowness of the epicenter contributed to widespread structural damage. An earthquake of similar magnitude, but deeper in the ground would have resulted in much less shaking on the surface and hence less damage to buildings.

The scale of the natural disaster was compounded by man-made failures to build earthquake resistant structures. Large-scale damage to buildings is associated with a lack of adherence to safe building standards and basic earthquake resistant construction methods. Most of the private homes used low-quality building materials and lacked essential structural frames and reinforcing pillars and collapsed easily as a result of lateral shaking movements. The poor are the least able to afford building safe houses and many of their homes were damaged. Many public buildings also collapsed due to poor building standards, in particular schools, many of which were built in the 1970s and 1980s with special government grant funds. Clearly, there was minimal enforcement of building codes.

Given the prevalence of home-based industries, the economic losses caused by destroyed or damaged homes were particularly large. Large numbers of furniture, ceramics and handicraft makers saw their livelihoods destroyed together with their homes. The destruction of private uninsured assets adds substantially to the loss estimates.

Given the large-scale destruction, it is fortunate that not more people died. That the earthquake hit on a Saturday morning around 6 a.m., when most people were already awake and busy with morning chores outside their houses, stemmed the already considerable death toll. Had the earthquake occurred during school or work hours, the number of fatalities would surely have been much larger. However, the number of injuries is estimated at 40,000 to 50,000 as many houses with substandard construction collapsed on their inhabitants.

The Impact

Poverty – already above the national average in this area – will be exacerbated by the earthquake. Nearly 880,000 poor people live in the affected areas. It is estimated that an additional 66,000 might fall into poverty and 130,000 might lose their jobs as a result of the earthquake. The impact on job losses is especially severe in services and small scale manufacturing. Preliminary estimates suggest that the region's gross domestic product might fall by 5%, with an economic contraction as high as 18% in the worst hit districts.

Transitional housing and services will be concentrated largely on existing home sites. A snap survey found that 74% of the households with houses completely destroyed were living in tents on their existing plots. In these circumstances, it is critical to ensure a quick recovery of basic water and sanitation in the affected areas. Some villages report that the quality and taste of the water has declined even though the water supply is intact. Women and girls have consistently raised the need for underwear, sanitary napkins and cooking equipment.

The psychological trauma of this disaster should not be underestimated. Qualitative reports indicate that trauma levels are high in severely affected areas. The stress is significantly compounded by the threat of an eruption at the Mount Merapi volcano. While people are quickly mobilizing to ensure adequate temporary accommodation, it may take some time before households are ready to engage in planning activities.

Key Issues in Going Forward

Although damage and losses are very large, the nature of the damage differs substantially from Aceh and Nias. With most of the large-scale infrastructure intact and only modest losses to local governments on the ground, the challenge of reconstruction is less daunting when compared with Aceh and Nias. A masterplan to cover all the integrated aspects of reconstruction is not required. The sequencing of reconstruction is far less of a challenge either. Those sectors that suffered relatively minor damage and losses can easily be handled through existing central and local institutions covered by the national and local budget.

The single, most consequential decision to make is how to ensure that the newly built and repaired houses adhere to proper building standards to ensure that such losses are never repeated again. Many of the private houses and public buildings would not have withstood an earthquake of an even lower magnitude. The scale of this damage can be prevented in future. However, this will require a large-scale program of housing reconstruction that facilitates new earthquake resistant homes. Experience in Aceh suggests that this can be accomplished. The highly concentrated impact of this disaster coupled with limited infrastructure damage, and strong local communities and local governments suggests that it can be done more quickly than in Aceh and Nias.

The emerging lessons of Aceh and Nias confirm the value of taking a community-driven approach to reconstruction. People are passionate about their homes. They have strong and often very diverse preferences. And they need to be closely involved in the choices that affect their most important asset. People engaged in rebuilding their homes are also taking responsibility for rebuilding their lives – a key part of the healing process. Their passion and intense personal interest in rebuilding their homes is also the most powerful tool to utilize for effective monitoring of the flow of funds to prevent corruption and malfeasance. For these reasons, the community-driven approach has consistently demonstrated important advantages and should be the model for going forward in Yogyakarta and Central Java.

Speed is critical in planning and implementing a rehabilitation and reconstruction plan. Homeowners are already, or will soon start reconstructing their homes, and if these homes are built to the same standard as their previous homes, they will again be vulnerable to a future disaster. Similarly, many of the SMEs that were affected will need short-term assistance to get back on their feet. Rapid loans and/or other types of financial assistance to help them rebuild structures, equipment, and replenish stocks will enable them to rapidly begin generating incomes again.

Given the magnitude of the funds required and the high portion that will flow in grants to households, a strong monitoring and evaluation framework is essential. Large-scale reconstruction often suffers from a lack of timely information about progress and an evaluation of existing programs. This assessment provides a large amount of baseline data against which the reconstruction progress can be monitored.

This new tragedy, coming so closely on the heels of the tsunami, reiterates the need for comprehensive disaster preparedness and risk management. The Yogyakarta earthquake cannot be analyzed as an isolated event. In fact, the value of its effects must be taken into consideration with the ones that Indonesia sustained in the Province of Aceh as a result of the 26 December 2004 Indian Ocean Earthquake and Tsunami. The combined effects of the two disasters are of significant magnitude for the Indonesian Government to seriously consider entering into disaster risk management practices, with special reference to financial risk transfer schemes, if it wishes to reduce the impact of future events.