

ASIAN DEVELOPMENT BANK

**AN INITIAL ASSESSMENT OF THE IMPACT
OF THE EARTHQUAKE AND TSUNAMI
OF DECEMBER 26, 2004
ON SOUTH AND SOUTHEAST ASIA**

January 2005

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I. INTRODUCTION

1. This brief note summarizes the information available until January 10, 2005 about the seismic shift that took place in the morning of December 26, 2004 in the Indian Ocean in the province of Aceh in Indonesia, and the ensuing tsunami that devastated some areas in East and Southeast Asia. It offers an initial assessment of the possible economic impact of the disaster, although this should be taken with caution as there is still a great deal of noise: information regarding casualties is changing rapidly, information on the extent of the physical damage is still unreliable, and the amounts pledged by the international community for relief and reconstruction have not been clearly established yet. Most of the figures used in this note have been taken from newspapers, websites and initial assessments of other institutions. The initial assessment contained in this note is based on an analysis provided by a group of ERD economists.¹ The Regional Departments are preparing individual country reports with more detailed information.

2. In the morning of December 26, 2004, an earthquake that measured 9.0 on the Richter scale hit the province of Aceh in the island of Sumatra in Indonesia. The seismic movement induced a tsunami or giant wave that shortly afterwards affected not only the Aceh area, but also some coastal areas in Malaysia, Myanmar, and Thailand. Hours later the giant wave reached Bangladesh, India, Maldives, and Sri Lanka. Again hours later, it reached the shores of the Seychelles, and even those of Kenya, Somalia, and Tanzania in Africa.

3. Following the confusion of the first few hours, reports started arriving documenting the magnitude of this rare disaster. As of January 10, 2005, these reports indicate that close to 165,000 persons may have died (Table 1).² Houses, boats, ports, hotels, clinics, roads and railways, small fishing boats, shops, vehicles, small family businesses, and hundreds of thousands of jobs were lost. The human loss will be the true tragedy of this disaster. It is the small local communities that have been badly affected and which most need quick assistance. Preventing long-term negative effects will depend on the capacity that governments and the international community display in order to provide relief assistance quickly to those affected, and to expedite reconstruction. Moreover, derived health-related problems such as water-borne diseases (Table 1) have started appearing, and authorities have warned that if these diseases spread because of unsanitary conditions, the death toll could be much higher—up to 300,000 according to UNICEF.

4. However, it appears that despite the unprecedented scale of loss of human life, homelessness, and displaced populations, the macroeconomic impact of the disaster will be limited and marginal. The damage is largely confined to rural areas rather than key economic and densely populated urban centers and industrial hubs. Still, the economic impact will be felt severely at the local and community levels, dragging hundreds of thousands of already poor people into even deeper poverty.

¹ The economists involved were Douglas Brooks, Jesus Felipe, Akiko Hagiwara, Yun-Hwan Kim, Cyn-Young Park, Grace Sipin, Guntur Sugiyarto, and Fan Zhai.

² For comparison purposes, Hurricane Mitch, which devastated Central America in 1998, killed about 10,000 people.

II. PHYSICAL DAMAGE AND ITS ECONOMIC IMPLICATIONS

5. Judging by the extent of the damage, the economies of the Maldives and Sri Lanka are the most affected due to their smaller size. These two economies would have difficulties in overcoming the disaster on their own and their recovery will depend on the extent and coordination of international assistance. Very preliminary estimates about Sri Lanka reported by the press indicate that the tsunami tore up railways and roads and destroyed 100,000 homes and 150,000 vehicles. Fortunately, the port of Colombo sustained only light damage. Sri Lanka has a large budget deficit, which will make it difficult to dedicate funds to the disaster areas. It is expected that tourism revenues will decrease, deteriorating its current account deficit.

6. The economy of the Maldives depends largely on tourism revenues (Table 2). With its tourism economy in disarray, the islands' recovery will depend on international aid. The government has indicated that the damage to homes and infrastructure such as telecommunications and health care systems was significant, and has estimated that two years' worth of GDP will be needed to put them back in place. More than 100,000 people, equivalent to 35% of the population, have been severely affected by the tsunami, more than 42 islands were flattened, and the entire infrastructure in 13 of the 202 inhabited islands was lost. Likewise, 29 of the country's 87 resort islands suffered damage. Sectoral effects are mostly in tourism and fisheries, accounting for 33% and 7% of GDP, respectively.

7. While Indonesia has been severely affected in terms of losses of human life (Table 1), the overall Indonesian economy will be barely affected. The disaster has been concentrated in the provinces of Aceh (it is estimated that around two thirds of this province have been very badly affected) and North Sumatra (very limited damage). No major economic activity or heavy industry has been affected; oil and natural gas production facilities in Aceh and Northern Sumatra have survived intact. Moreover, the region is not an important tourist destination. Aceh accounts for around 2% of Indonesia's GDP and population, and oil and natural gas contributes around half of Aceh's GDP. This indicates that the damage to Indonesia's economy should be slight, although the human suffering is, and will be, great. Aceh's population depends mostly on agriculture, so the extent of the damage will depend partly on how much agricultural land was inundated by the water and affected by salination.

8. The same applies to the case of India, where due to the size of its economy the macro impact will be minimal. The port city of Chennai in southeast India was hit, but the city's industrial and port infrastructure have not been affected. In Bangladesh, Malaysia, and Myanmar the impact has also been minimal at the macroeconomic level, although tremendous for individual families.

9. In the case of Thailand, the damage was concentrated around the famous beach resort areas in six southern Thai provinces, which draws an important part of Thailand's tourism revenues. Extensive material damage was restricted to some very specific areas (hotels and resorts), so the problem of "negative perception" in Western countries (very important for the tourism industry) must be avoided, emphasizing that Thailand's tourism industry, infrastructure, and capacity are intact. Nevertheless, while it is expected that Thailand's tourism industry will take a slight hit, most of the country's tourist spots, including Bangkok, have been spared. Initial estimates (*Time* magazine) indicate that on the beach resort island of Phuket, 3,000 hotel rooms were damaged or completely

washed away (although a later report by CNN has indicated that the number of affected rooms is as high as 13,000). Nevertheless, about 70% of the island's hotels were fully operational only a couple of days after the disaster. The area affected accounts for around 3% of the country's GDP and population (Morgan Stanley figures). In terms of dollars, the six southern provinces most affected by the tsunami generate about \$2 billion annually, or about 1.3% of Thailand's GDP. It can be expected that the number of tourists to the area will probably decline during January-March 2005, but should pick up again. The rest of the country should not be affected unless there is some sort of negative perception about the country's safety that leads to a domino effect.

10. As Table 2 indicates, following strong growth from 2001 to 2003, the economies of India, Indonesia, Malaysia, and Thailand should be in a position to overcome the tragedy. For these countries, recent growth has been strong, fiscal positions have improved, and external reserves are high, with the shock absorber of the disaster likely to come from the government's fiscal position. In the case of Thailand, the Thai government was already planning large government spending. The disaster probably justifies even higher amounts, concentrated in the areas affected. In fact, a US\$715 million relief package and a US\$770 million loan program for ruined business were quickly approved. In the cases of India and Indonesia, new governments were elected in 2004. The disaster will require them to display their effectiveness, not only in terms of allocating funds, but also in terms of effective administrative and planning capacities for tackling bottlenecks. Finally in the case of Sri Lanka, the situation could be an opportunity to advance the peace talks.

III. SOME ECONOMIC CONSIDERATIONS AND PROSPECTS FOR RECOVERY

11. Previous disasters provide us with some insight into the likely economic impact of this tragedy. It must be emphasized that the earthquake and tsunami of December 26 are disasters that cannot be compared with the 1997-1998 financial crisis in East Asia, or even with the SARS epidemic of 2002-2003. There are three important differences:

- (i) The disaster of December 26 is a one-time event that took place in a short period of time and which will probably not reoccur in the near future. The financial crisis of 1997-1998 and the SARS epidemic, on the other hand, were events whose development spanned months.
- (ii) The financial crisis of 1997-1998 (not the SARS outbreak) was the result of and response to a certain economic behavior (e.g., exchange rate misalignment, real estate bubble, governance problems). The impact of the earthquake and tsunami on the affected economies will come through different channels and the problem also requires different responses.
- (iii) In the case of the financial crisis and SARS, there was a crucial element of uncertainty, expectations, and loss of confidence that induced a negative spiral. This affected business sentiment, consumption, interest and exchange rates, and other economic variables. Recovery could not begin until economic agents perceived that some bottom had been reached. This should not be the case now. In this type of disaster (e.g., the September 11, 2001, or the 2002 Bali bombing attacks), after a deep sentiment of sadness, a quick recovery process follows in a V-shape, triggered by a feeling that after the tragedy life

must go on. Investment in particular recovers very quickly with a view to cleaning up the destruction left behind and putting into place new buildings, roads, etc. If the effects of the 1997-1998 financial crisis and of the SARS outbreak have been well absorbed into the economies, and have not lasted decades, following three years of strong growth, the economies of India, Indonesia, Malaysia, and Thailand should be in a strong position to overcome the tragedy.

12. The direct economic impact of the December 26, 2004 events will come through the negative effects on consumption and business activity in the areas affected. The disaster should not have an impact on the financial markets, much less lead to a financial or economic crisis. Standard and Poor's has already announced that despite the extensive property damage and loss of life, sovereign credit ratings of the Asian countries affected would not be modified. So far the currencies of the affected countries have remained stable and the financial markets have been calm. The tsunami has not had an adverse impact on stock markets. The two most affected sectors by the events of December 26, 2004 are probably tourism and fishing.

13. The indirect impact is harder to determine and measure since it is the result of (iii) in paragraph 11. The tourism sector could be negatively affected for a short period of time if tourists, in particular from the European countries more affected by the tragedy, display some reticence to return, and veto the region as they perceive the area as dangerous due not only to this disaster but also to the Bali bombing and the SARS and bird flu outbreaks. This can be overcome by a well-designed advertising campaign. Tourism in the region will likely recover sooner after this disaster than it did following the SARS outbreak.

14. As it is expected that some economic activities will be affected in particular (e.g., tourism) by the disaster, GDP could be negatively (though marginally) affected. However, reconstruction from natural disasters requires new investment that should have a positive impact in the following periods. Investment should translate into jobs. The aid process has already increased demand for a range of domestic goods and services, including food, drink (water), medicines, building materials, and clothing, as well as transport and communication services, which will benefit a number of domestic businesses. Therefore, it is possible that the overall impact could well end up being somewhat positive. As indicated above, the loss has been huge in terms of houses, boats, ports, hotels, clinics, roads, and railways. All these will have to be rebuilt and there will be an investment surge that may have a large positive multiplier effect. Most of these infrastructures can be rebuilt quickly and major infrastructures are for the most part undamaged. To the above, it must be added that the tourism industries of Bali and the Philippines could pick up some of the diverted tourism from Thailand and the other affected countries.

15. Table 3 offers a qualitative assessment of the effects of the earthquake and tsunami on the affected economies.³ As indicated above, the two most affected countries will be the Maldives and Sri Lanka. The damage on India and Thailand is less extensive and should have no substantial impact on the overall economy. In the case of Indonesia, although the region of Aceh has been badly affected, Aceh represents a very small share of the country's economy. Finally, the impact on Bangladesh, Malaysia, and Myanmar will be negligible if at all.

16. If previous experiences with natural disasters provide any guidance, we should expect some decrease in economic activity followed by a policy response that tends to involve increased government spending, leading ultimately to economic recovery in about a year. It is very difficult to provide a precise estimate of the number of months or years it will take for the regions affected to be back on their feet. It is perhaps relatively easier to do this for the affected areas of India, Malaysia, and Thailand. These should be back on their feet and fully operational in 2005. On the other hand, it is more difficult to appraise the cases of the Maldives and Sri Lanka, the two most affected countries. Some examples could be useful in terms of drawing insights from other disasters:

- (i) In the case of the Gujarat earthquake of 2001, some 370,000 houses were destroyed, which had to be rebuilt, and around 650,000 other houses required repair. Also, about 300,000 families had to stay in temporary accommodation. The Gujarat state government launched a massive rehabilitation and reconstruction plan and the World Bank designed an assistance program to be implemented in three phases spanning 9-10 years. It took the affected area around 4 years to be rebuilt. In 2001, ADB provided a US\$500 million emergency loan to support the state government's efforts to reconstruct and restore essential infrastructure. In addition, ADB has established an extended office in Gandhinagar, close to the earthquake-affected areas, to ensure prompt and efficient implementation of the rehabilitation project.
- (ii) On September 19, 1985, Mexico City suffered the devastating effects of an earthquake, which left 5,000 people dead and destroyed 48,000 houses. After the earthquake, 24,000 affected families had to live in temporary shelters for two years. The reconstruction work started right after the disaster and lasted for slightly over two years.
- (iii) On January 17, 1995, 5,400 people were killed in the Kobe earthquake in Japan. As many as 134,000 houses were leveled to the ground and thereafter 31,000 affected families had to live in temporary houses for three to four years. The reconstruction work started in July 1995 and was completed in August 1999.
- (iv) At least 8,000 people lost lives and 230,000 houses were seriously damaged or collapsed in the devastating earthquake that affected Latur in Maharashtra on September 30, 1993. About 30,000 affected families had to stay in temporary houses for four years. The reconstruction work begun in July 1994 and was completed in June 1999.

³ This assessment is based the judgment of the ERD economists referred to in footnote 1.

IV. INTERNATIONAL ASSISTANCE

17. As of January 10, 2005, the relief aid pledged by the international community amounts to about US\$5.0 billion. This refers to bilateral and multilateral aid, and it is a mix of loans, grants, and credit facilities. The largest donors in US \$ terms are as follows: (i) Australia, 816m; (ii) ADB, 675m; (iii) Germany, 664m; (iv) Japan, 500m; (v) United States, 350m; (vi) World Bank, 250m; and (vii) Norway, 182m. There were significant pledges from United Kingdom; Italy; People's Republic of China; Sweden; Canada; Denmark; Spain; France; Taipei, China; and Republic of Korea amounting to US\$743 million. It is not known, however, how the pledges will translate into actual disbursement and how the pledges will be distributed between relief and reconstruction aid. It is important to mention that the UN has raised concerns regarding whether the promised aid will indeed materialize. In the past, often governments that had initially pledged funds failed to make good on their promises.⁴ So far, a number of creditors, including the United States, International Monetary Fund, and Germany have announced that they may grant debt relief for Indonesia and Sri Lanka. The Paris Club is also considering a debt moratorium for countries hit by the disaster.

18. An outcome of this disaster is that it could foster greater international cooperation, especially among Asian nations. On January 6, 2005 an international donor summit was held in Jakarta to help coordinate relief efforts. UN Secretary General Kofi Annan indicated that the affected countries will require around US\$1 billion in the next six months. The President of the European Commission announced that the European Union will provide US\$100 million for immediate assistance. Two important proposals discussed in Jakarta were that of the establishment of a tsunami early warning system for the Indian Ocean, similar to the one in place in the Pacific; and the possibility of a debt moratorium for the countries affected by the disaster.

19. President Chino attended the Jakarta meeting. Mr. Chino said that up to US\$500 million would be provided to Indonesia, Maldives, and Sri Lanka in the form of grants and highly concessional loans, in addition to reallocations from on-going programs. President Chino also announced that ADB was prepared to lead and fund a US\$1 million study to develop a tsunami early warning system.

V. IMPACT ON POVERTY

20. One of the factors that has led to the initial assessment that the GDP impact of the tsunami will be slight is that most people affected in the agriculture and fishing sectors have been bypassed in the rapid growth of the last four years. Two implications follow: (i) the headcount measure of absolute poverty will increase as a result of the tsunami if people who were above the poverty line before the tsunami fell below the poverty line after it; and (ii) for people below the poverty line before the tsunami, the poverty gap or misery index is likely to increase as a result of these poor people losing their scarce means of livelihood.

⁴ In the case of Hurricane Mitch, governments promised to send more than US\$3.5 billion, while the World Bank, International Monetary Fund, and the European Union pledged US\$5.2 billion. It has been reported that less than a third of the money was delivered.

21. Thus, for the same reason that the macroeconomic effects may be slight, the poverty impacts may be substantial, especially at the local level. Poverty is potentially the most important effect of this natural disaster. In the case of India, the affected states are Andhra Pradesh, Kerala, Pondicherry, Tamil Nadu, and the islands of Andaman and Nicobar. Initial estimates indicate that the number of poor people in India could increase by 645,000. In Indonesia the disaster will add at least 474,619 displaced persons, and by taking into account other indirect effects, the number of poor people could increase by more than 1 million. In Sri Lanka, the devastating effects of the catastrophe could add around 250,000 more poor people. In the Maldives, about half of the country's houses were affected and absolute poverty of 43% in 1998 could increase to more than 50% as a result of the tsunami, or the number of poor would increase by about 24,000. Equally important, the likely increase in the poverty gap among the already poor is of serious concern and needs to be urgently addressed. The poverty impact on other countries affected by the tsunami is insignificant.

22. As indicated in paragraph 3, the number of poor people could further increase if concerns over sanitation and health conditions, as well as other basic needs of the survivors, are not properly and quickly addressed. Governments in the affected regions and the international community should work together in overcoming the immediate and more long-term problems in the aftermath of the tsunami disaster. This event should be taken as an opportunity to advance in the Millennium Development Goals.

VI. GROWTH PROSPECTS FOR 2005-2006

23. Although quantifying the economic and financial impact of such a large natural disaster is inherently difficult, it can be said that the hits to the region's tourism industry and GDP growth will be nowhere near the damage caused by the SARS outbreak in the first quarter of 2003, despite the fact that SARS claimed fewer than 800 lives. Overall, ERD's country and regional outlook for 2005 does not change. The factories, high-tech research centers, and ports that drive Asia's growth escaped largely unscathed, except for minor damages reported in some factories in India.

24. The negative impact on the Indian macro economy, either in 2005 or 2006, will be marginal. The Government of Thailand has downgraded its 2005 GDP growth estimate and cut it by three-tenths of a percentage point to 5.7%. For this decrease to materialize, the physical damage to the affected areas would have to be significantly larger than it was, and would have to be accompanied by a significant decrease of tourists in the coming months due to the psychological effect of returning to a place that may bring bad memories. In any case, the shock should be absorbed by the economy in 2005. In the case of Indonesia, a round of negative effects may take place. Indonesia is the country with the highest number of casualties. If reconstruction efforts do not move fast and the number of casualties increases significantly due to health-related problems, then the situation in the Aceh region might worsen (e.g., significant decrease in consumption and business activity) and have political implications. At most, there could be very mild decreases in GDP growth in both 2005 and 2006, of at most 0.2%. For the Maldives and Sri Lanka, probably, the impact will be higher, but difficult to quantify at this point.

VII. CONCLUSION

25. The Maldives and Sri Lanka, on account of their small geographical size, structure of their economies, and large fiscal deficits, will be the most adversely affected countries in terms of economic impact. Given the length of the Indonesian archipelago, that the tsunami disaster was localized around Aceh and North Sumatra, and oil and natural gas facilities survived intact, the adverse economic impact on Indonesia is likely to be slight. Given the multiplier effects of reconstruction efforts, India and Thailand could post higher GDP growth rates than originally forecast.

26. Notwithstanding the above, the most important effect of this disaster, besides the immediate toll in human suffering, is that it has put at risk of sinking into deeper poverty nearly 2 million people throughout the region. These people have lost their already precarious employment and means of living and it may take some time for the affected communities to get back on their feet.

27. The tsunami disaster should be seen in the context of other disasters that have hit Asia. Historically Asia has been subjected to regular unexpected shocks. The developing countries of Asia have always responded swiftly and pragmatically. Resilience in the face of turbulence has characterized Asia. Sound macroeconomic management, particularly fiscal discipline, has been fundamental in providing governments with the needed degrees of freedom to respond. At the microeconomic level, the availability of appropriate institutions, incentives, and infrastructure is a precondition for firm level flexibility. The impressive improvements in both macro and microeconomic fundamentals will make developing Asia increasingly resilient. Therefore, with the passage of time, the wounds from the tsunami disaster will heal, the lessons would have been internalized, and the affected countries will emerge stronger to face future challenges.

Table 1: Summary of the Human Impact of the Earthquake and Tsunami of December 26, 2004

	Casualties ^a				Health Problems (Number of Cases)
	Dead	Missing	Displaced	Affected	
Sri Lanka	30,718	3,858	876,883	15,686	Diarrhea
Indonesia	113,306	7,191	Na	Na	
Maldives	82	26	13,311	100,000	Acute diarrhea (225), viral fever (124), injuries (552), anxiety/shock (152)
Thailand	5,265	4,499	na	na	Acute diarrhea (167), wound infections (163), food poisoning (33), pneumonia (20), malaria (8), dengue (7)
India	15,693	5,900	na	na	
Malaysia	74	6	8,000	299	
Myanmar	90	na	na	45	
Bangladesh	2	na	na	na	
TOTAL	165,230				

^a As of 9 January 2005; sourced from the UN Office for the Coordination of Humanitarian Affairs, CNN, and Reuters News.

Table 2: Some Economic Indicators of the Affected Countries

	Share of Tourism to GDP (%) ^a	Share of Agriculture (%)			Fiscal Balance as % of GDP			GDP Growth (%)		
		2001	2002	2003	2001	2002	2003	2001	2002	2003
Sri Lanka	0.7	20.1	19.8	19.0	-10.8	-8.9	-8.0	-1.5	4.0	5.9
Indonesia	16.6	15.6	15.4	15.3	-2.3	-1.7	-2.1	3.8	4.3	4.5
Maldives	32.8	8.0	8.1	8.1	-4.7	-4.9	-4.1	3.5	6.5	8.5
Thailand	5.1	10.4	10.0	10.2	-2.4	-1.4	0.4	2.2	5.3	6.9
India	1.1	24.1	22.0	22.1	-9.9	-9.5	-9.4	5.8	4.0	8.2
Malaysia	13.3	8.0	8.1	8.1	-5.5	-5.6	-5.3	0.3	4.4	5.3
Myanmar	na	-	-	-	5.9	4.1	-	11.3	10.0	10.6
Bangladesh	0.6	25.0	24.0	23.5	-5.0	-4.6	-4.2	5.3	4.4	5.3

^a Refers to the share of the Hotel and Restaurants sector to total GDP (from *Asian Development Outlook 2004*) except for the Maldives, which refers to the share of Tourism sector to total GDP.

Table 3: Qualitative Assessment of the Effects of the Earthquake and Tsunami of December 26, 2004

	Tourism^a	Agriculture and Fisheries^b	Poverty	Overall Economy
Maldives	HIGH	HIGH	HIGH	HIGH
Sri Lanka	HIGH	HIGH	HIGH	HIGH
Indonesia	LOW	HIGH	HIGH	LOW
Thailand	MEDIUM	LOW	LOW	LOW
India	LOW	LOW	LOW	LOW
Malaysia	LOW	LOW	LOW	LOW
Myanmar	LOW	LOW	LOW	LOW
Bangladesh	LOW	LOW	LOW	LOW

^a This refers to the impact on the overall economy.

^b This refers to the impact on the affected areas.