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**Adjustment and Recovery in Thailand
Two Years after the Tsunami**

Bhanupong Nidhiprabha

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ADB Institute Discussion Paper No. 72

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Abstract

This study examines Thailand's responses to the December 2004 tsunami and evaluates its reconstruction effort two years after the disaster, supplementing publicly available data with information from a field survey. Though the immediate response to the disaster can be considered a success, and much progress has been made with reconstruction, poor coordination among agencies has hampered effective and equitable delivery. Most households saw the tsunami as a 'temporary shock', and were primarily interested in house reconstruction and returning to previous occupations rather than job retraining and relocation. Credit market constraints affected the capacity of poorer households to smooth consumption. The study highlights the importance of adequate and equitable financial assistance, and the value of counseling and advice to cope with mental trauma and stress. There was no evidence that such assistance leads to aid-dependency. In contrast to Indonesia and Sri Lanka, the Thai government relied primarily on domestic sources to finance reconstruction, and construction cost escalation was not a major problem. Thailand did, however, ask developed countries for better market access for its exports, arguing that removing barriers to developed country markets is the best way of assisting developing countries hit by disasters.

JEL Classification: Q54, F35, H54, I38, O19

1. INTRODUCTION

The tsunami that hit six southern provinces of Thailand on 26 December 2004 is the worst natural disaster Thailand has ever experienced in terms of human tragedy, bringing incalculable misery to affected communities and massive damages to their livelihoods. It killed over 8,000 people and injured thousands more; it damaged or destroyed thousands of houses, other buildings, roads, bridges, and other physical infrastructure. Because the tsunami hit some of Thailand's most popular beach tourist resorts, a large number of foreign tourists were among the dead and injured.

Total damages were assessed at around \$508 million, while losses were estimated at \$1,690 million, totalling \$2,198 million (1.4 per cent of GDP).¹ The impact on the affected provinces was quite severe: it was assessed to be equivalent to one half of the combined gross provincial product (GPP). In some cases, such as in the case of Phuket, damage and losses equalled 90 per cent of GPP, and in Krabi and Phang Nga, they were around 70 per cent.²

Though the impact of the tsunami was quite severe, after accepting technical assistance at the early stages, Thailand relied mostly on its own resources in coping with the reconstruction tasks, unlike Indonesia and Sri Lanka. Thailand's experience with the wider economic effects of large-scale reconstruction activities also seems to have differed from that of other affected countries in some respects. Overall Thailand appears to have been more successful than Indonesia and Sri Lanka in overcoming the economic effects of the tsunami. This provides an interesting contrast to the experience of Indonesia and Sri Lanka, which relied heavily on international assistance in their reconstruction efforts.

This paper provides a descriptive and analytical narrative of the post-tsunami relief efforts and reconstruction activities in Thailand. This narrative can facilitate comparative analysis of the experiences of the three countries. The paper is organized as follows: Section 2 describes briefly the damage and costs of the tsunami, followed by an examination of the immediate response after the disaster in Section 3. Section 4 discusses short-term economic effects of the tsunami, and Section 5 discusses the experience of rehabilitation, reconstruction, and recovery. In Section 6 we discuss the issues related to adequacy, efficiency, and effectiveness of aid and assistance. The above discussions are based largely on secondary data. As part of this study, we conducted fieldwork in the tsunami-affected areas and obtained primary data from a sample survey of displaced and non-displaced individuals, visitors, and seven NGOs in the three most severely affected provinces. This information is presented in Section 7. In Section 8, we summarize the main findings of the study and present some policy implications.

2. DAMAGE AND COSTS

In the cases of Indonesia and Sri Lanka, the largest economic losses from the tsunami came from damages to physical infrastructure and property. In contrast, Thailand's biggest source of losses was estimated to have come from productive sectors, particularly tourism, because the most severely affected areas were key tourism destinations. As a result, initial estimates of analysts led to forecasts of significant reductions in the GDP growth rate. JP Morgan, for example, revised the first quarter growth rate of 2005 to zero from the previous projection of 3 per cent. The 2005 annual GDP growth rate was also revised downward by 0.3 per cent to 5.7 per cent. Similarly, Morgan Stanley reduced its annual growth projection from 6 per cent

¹ See Telford, Cosgrave, and Houghton (2006).

² United Nations and World Bank (2005): p. 19.

to 5.7 per cent, citing, in particular, the dampening multiplier effects on the economy of the damage caused by the tsunami on the tourism industry.

Figure 1 provides data on the six Thai provinces hit by the tsunami. Of the six, Phang Nga, Phuket, and Krabi were the most severely affected. Phang Nga—in particular the Kao Lak and Ban Nam Kem areas—suffered the most in terms of human and economic losses (79 per cent of the total 5,395 casualties) (Table 1 and Figure 1). Krabi sustained the second heaviest loss of life (13 per cent), but damages to infrastructure and the business sector were higher in Phuket, which suffered the most serious damage to infrastructure of around \$100 million. Ranong, Trang, and Satul, which are not tourist destinations like the other three provinces, suffered mainly from damages to aqua culture and destruction of fishing boats and equipment.

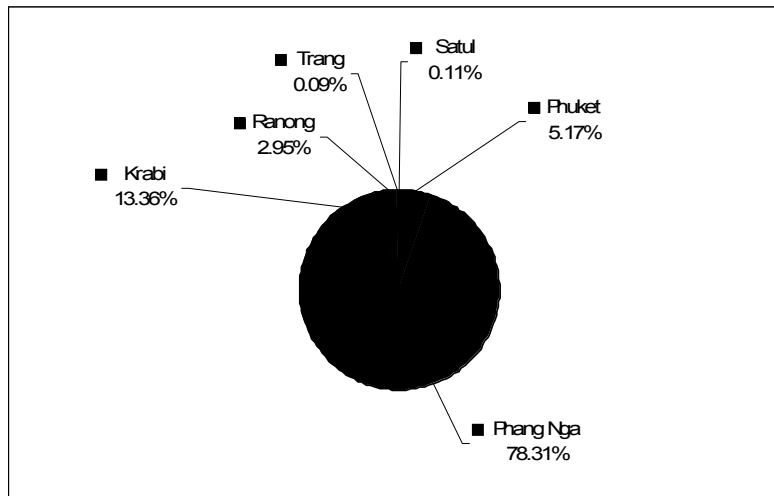
Table 1: Numbers of Dead, Missing, and Injured due to the December 2004 Tsunami

Province	Dead				Injured			Missing		
	Thai	Foreigners	Unidentified	Total	Thai	Foreigners	Total	Thai	Foreigners	Total
Phuket	151	111	17	279	591	520	1,111	245	363	608
Phang Nga	1,389	2,114	722	4,225	4,344	1,253	5,597	1,352	303	1,655
Krabi	357	203	161	721	808	568	1,376	314	230	544
Ranong	153	6	-	159	215	31	246	9	-	9
Trang	3	2	-	5	92	20	112	1	-	1
Satul	6	-	-	6	15	-	15	-	-	-
Total	2,059	2,436	900	5,395	6,065	2,392	8,457	1,921	896	2,817

Source: Department of Disaster Prevention and Mitigation (DDPM), Ministry of the Interior

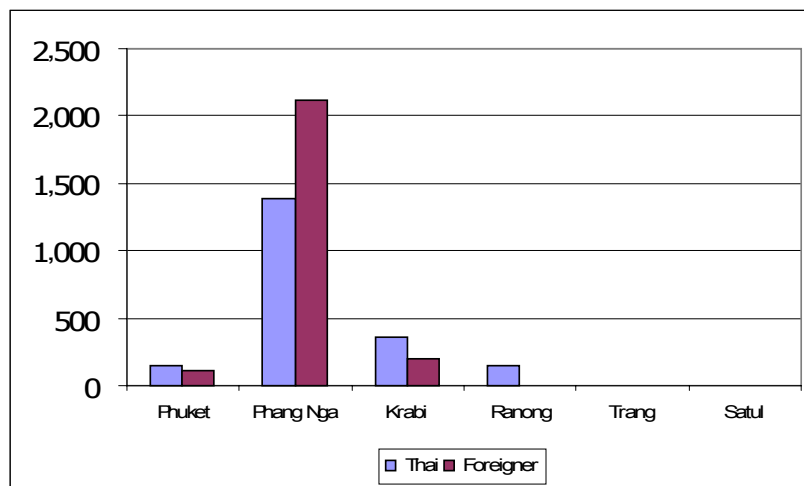
The initial relief efforts in Thailand were complicated by the need to deal with a large number of dead, injured, and missing foreigners. In most locations Thai casualties were higher than those among foreigners. However in Phang Nga, a major centre of tourism with the tourist season at its peak, foreign casualties exceeded Thai casualties (Figure 2). In addition, foreign casualties in Phang Nga also included a large number of migrant workers from Myanmar. Only eight foreigners reportedly lost their lives in Ranong and Trang. The 2,817 missing persons, most likely dead, suggests that large numbers were probably dragged into the sea by the giant waves.

Figure 1: Death Toll by Province



Source: Department of Disaster Prevention and Mitigation (DDPM)

Figure 2: Thai and Foreign Death Toll



Source: Department of Disaster Prevention and Mitigation (DDPM)

The impact of the tsunami was spread over a large number of villages in these provinces, which made provision of immediate relief difficult. Krabi had the highest number of affected villages, but not the largest number of casualties (Table 2).

In total, the tsunami directly affected 12,815 households comprising more than 58,550 people. A total of 3,302 houses were destroyed and 1,504 were damaged (Table 2). Phang Nga accounted for 52 per cent of total house destruction, followed by Phuket with 21 per cent, and Krabi with 14 per cent.

Table 2: Impact on Housing

Province	Number of people affected		Unit of residence affected		Total (number of houses)	Number of affected villages
	persons	households	destroyed	damaged		
Phang Nga	19,509	4,394	1,904	604	2,508	69
Krabi	15,812	2,759	396	262	658	112
Phuket	13,065	2,616	742	291	1,033	58
Ranong	5,942	1,509	224	111	335	47
Trang	1,302	1,123	34	156	190	51
Satul	2,920	414	2	80	82	70
Total	58,550	12,815	3,302	1,504	4,806	407

Source: DDPM

Damages to business properties accounted for most of the damage in Phang Nga, Phuket, and Krabi while damages to the fisheries sector were the most important in the other three provinces (Table 3). These differences in the nature of damages between the two groups of provinces meant that they required quite different rehabilitation and reconstruction activities: Phang Nga, Phuket, and Krabi needed urgent measures to restore tourism and business properties, while Trang, Ranong, and Satul required assistance to restore the fisheries industry.

Table 3: Damage to Livelihoods (\$ '000)

	Fishery	Livestock	Agriculture	Business property	Total damage
Phang Nga					
Nga	22,830	342	61	161,402	184,636
Krabi	4,792	8	9	67,091	71,900
Phuket	8,623	8	5	87,771	96,406
Ranong	4,268	76	16	21	4,381
Trang	1,723	1	46	165	1,935
Satul	2,985	6	29	-	3,020
Total	45,222	441	166	316,450	373,354
Per cent	12	87	100

Source: DDPM

Most of the losses inflicted on people's livelihoods (88 per cent) came from the damage to business properties in Phang Nga, Phuket, and Krabi. Most of these properties were hotels, which were critical to the tourism industry. Fisheries was the second most affected sector (12 per cent) while damage to livestock and agriculture was negligible. In Phang Nga, though most of the damage was to business properties, the fisheries sector was also significantly affected (Table 4). Many fishing boats were lost or damaged, and there were extensive damages to fish cages and shrimp hatcheries (which in turn affected the wider southern shrimp industry, which relied on supplies of post-larvae from these hatcheries).

Table 4: Tsunami Damage to Fisheries

Province	Fish cage culture	Shrimp hatchery	Damage (\$ mil.)
	Area affected (m ²)	Area affected (m ²)	
Phang Nga	140,870	16,131	22.8925
Krabi	66,282	0	4.79
Phuket	52,792	76,300	8.6225
Ranong	856,128	0	4.2675
Trang	23,660	0	0.3725
Satul	84,526	0	2.985
Total	1,224,258	95,431	43.935

Source: DDPM and Department of Fisheries

The total damage to roads and bridges was relatively minor (estimated at less than \$2 million). This also meant that emergency relief and assistance could be delivered relatively quickly immediately after the tsunami. The more costly damage to infrastructure came from the numerous damaged piers, which delayed fishermen from returning to their normal livelihoods (Table 5). Twelve schools were either destroyed or severely damaged, while another twelve suffered mild damage.

Table 5: Infrastructure and Public Utility Damage

	Piers		Concrete bridges		Wooden bridges		Box culvert and dykes		Roads	
	Unit	\$	Unit	\$	Unit	\$	Unit	\$	Unit	\$
Phang Nga	5	205,848	11	454,263	3	30,750	2	5,000	44	3,562,184
Krabi	2	762,500	2	180,000	-	-	-	-	3	179,050
Phuket	3	200,000	7	160,000	1	12,500	-	-	13	592,000
Ranong	27	231,175	8	192,225	2	10,000	11	69,400	27	231,145
Trang	1	-	1	1,875	-	-	-	-	8	22,973
Satul	-	-	-	-	-	-	-	-	3	177,500
Total	38	1,399,523	29	988,363	6	53,250	13	74,400	98	476,488

Source: DDPM

3. IMMEDIATE RESPONSE: DESCRIPTION AND ASSESSMENT

The emergency response following the disaster naturally focused on the provision of basic shelter, food, and medical assistance to affected people, and search and rescue missions for survivors stranded on remote beaches and small islands. It was the neighbouring communities who first rushed to the assistance of the tsunami victims.³ These community actions were followed by government initiatives and international assistance. The Tsunami Victim Relief Center was established on 26 December 2004 to coordinate mobilizing relief efforts from all sectors of the society. The Center provided an international and domestic call centre to provide information to relatives of both Thai and foreign disaster victims. It also

³ Telford, Cosgrave, and Houghton (2006).

acted as a 24-hour donation centre for both cash and essential supplies, which were transported by container trucks to the six provinces. Other donation centres were also established by government and non-government agencies.

The relief efforts focused on areas along Patong and Kamala beaches in Phuket, Khao Lak, Phi Phi Island, and Ban Nam Kem—the areas that were hardest hit. Some 30,293 people, comprising military personnel, policemen, volunteers, and 36 helicopters and six vessels from the Royal Navy, participated in the emergency relief activities. Rescue teams with search equipment came from a variety of places, including France; Germany; Hong Kong, China; Japan; Singapore; the Republic of Korea; Taipei, China; Italy, and the US. Local roads were repaired almost immediately to allow delivery of aid to the disaster areas. Telephone communications and electricity distributing systems in Phuket, Phang Nga, and Krabi were quickly restored and were back to normal within a few days. This immediate restoration of logistic infrastructure helped to improve the speed and coordination of aid delivery.

Distribution of aid and supplies donated by domestic and international sources was done through the Department of Disaster Prevention and Mitigation (DDPM). Supplies sent to Phuket airport were delivered by the army. Local administrations were responsible for cleaning up debris along the beaches to give confidence to tourists concerned about their safety.

The search for bodies and human remains was also undertaken immediately. Searches were carried out to locate bodies buried under damaged buildings, in the sea, and in the mangrove forest areas. An extensive process of to identify human remains using DNA techniques was undertaken to deal with the large number of unidentified bodies. The identification process was supported by volunteers and NGOs, who worked tirelessly in a corpse-clearing centre established at the temple of Wat Yanyao in Phang Nga. By October 2005, the forensic teams had been able to identify 4,148 bodies, while 1,247 bodies still remained unidentified.⁴

The next priority was to set up a centre to take care of over 34,000 tourists, including both Thai and forty foreign nationalities, and to help them return home. (Some tourists were provided with airfares to return home.)

The United Nations warned that the secondary impacts of the disaster could be deadlier than the first: people faced health risks due to contamination of drinking water and devastation of health care infrastructure. Close monitoring by the Ministry of Health helped to contain infectious diseases, while a mental health care program was successful in preventing suicides of survivors who were traumatized by the tsunami experience.

The scale of the disaster in Thailand was relatively small compared to other tsunami-affected countries such as Indonesia and Sri Lanka, but Thailand nevertheless faced complex logistical tasks in the immediate aftermath of the tsunami, and coped relatively successfully with these challenges. Thailand's success in the immediate relief effort has been attributed to a number of factors such as (1) the synergy generated by the Thai community in the provision of many forms of assistance, (2) the close collaboration and cooperation among civil, military, and police authorities, NGOs, charitable foundations, and civil volunteers, and (3) the influx of support and humanitarian assistance from international communities and NGOs (World Conference on Disaster Reduction (WCDR) Thailand Country Report (2006)).

⁴ By December 2006, the last 440 unidentified bodies, believed to be migrant workers from Myanmar, had been buried in the cemetery for unidentified tsunami victims in Kao Lak. Their DNA samples have been collected for possible future identification.

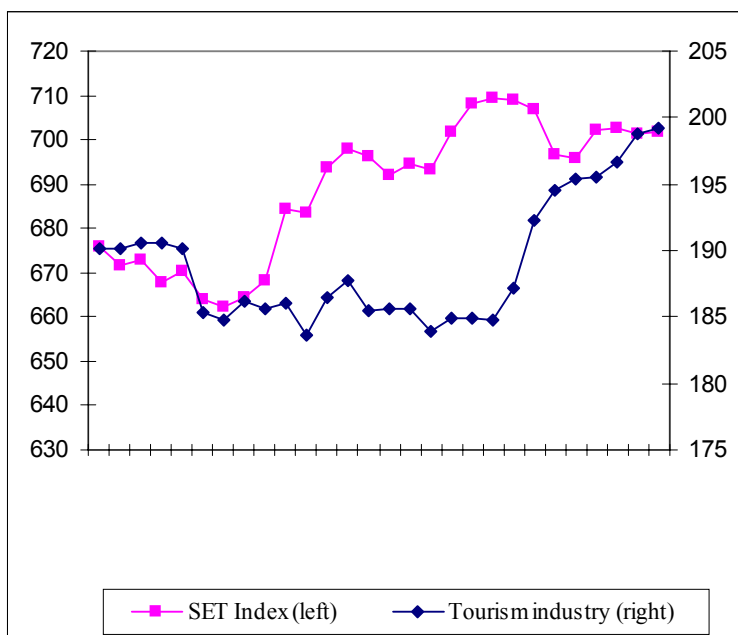
The challenge following the successful delivery of immediate relief was to implement rehabilitation and reconstruction activities to help the tsunami survivors to cope with immediate economic problems and move on to rebuild shattered livelihoods.

4. SHORT-TERM ECONOMIC IMPACT

The immediate economic impact of the tsunami was felt most acutely in the tourist industry, and to a lesser extent in the fisheries sector. The extensive damage to buildings—particularly tourist hotels—and the negative impact on potential tourists of the traumatic events associated with the death and destruction following the tsunami was expected to have a substantial negative effect on the overall economy. The consequences of an absence of tourists for even one year would have been devastating for both the tourist industry and the wider regional economy because each occupied hotel room translates into many related economic activities, generating employment for both local and migrating workers.

The initial assessments of the impact of the tsunami on the Thai economy can be gauged by the movements in the Thai stock market. Stock prices reflect investor expectations about the present value of the expected future stream of dividend payouts derived from corporate profits. The tsunami had an immediate impact on the Thai stock market. The overall security exchange index (SET) fell during the first few trading days after the disaster, reflecting concerns about the longer term impact on the Thai economy (Figure 3). But market participants, after this initial (over)reaction to the tsunami, revised their assessments and concluded that the economy would not suffer much from the tsunami in the long term. The SET index rebounded within a week, though the stock price index relating to the tourism industry was depressed longer, faced with a continuous bombardment of bad news. Nevertheless, as the market reassessed the damage even the tourism industry index recovered within a month. By the end of January 2005 it had even exceeded its pre-tsunami level, rising in line with the SET index.

Figure 3: Impact of the Tsunami on the Thai Stock Market



Source: Tourism Authority of Thailand

This investor assessment of the long-term impact of the tsunami on the economy was, however, more optimistic compared with the early assessments of most official and private sector analysts. As already mentioned, JP Morgan predicted a zero growth rate for the first quarter of 2005, while both JP Morgan and Morgan Stanley revised downward their annual growth forecasts by 0.3 per cent. The Bank of Thailand also projected a reduction of annual GDP growth by 0.3 per cent due to the tsunami, even after taking into account the growth momentum of the last quarter in 2004, and expected compensating effects of soft loans and other assistance. In the worst-case scenario, if no tourists were visiting the affected areas, GDP was projected to decline by 1.3 per cent.

The tourism industry in the affected provinces experienced a significant negative impact in the immediate post-tsunami period. This was caused primarily by a fall in tourist arrivals, rather than because of the damage to hotels and other tourist infrastructure (Table 6). The striking reduction was most evident in the occupancy rate, but hotels in the three provinces also experienced on average a shorter duration of stay. The key issue was not so much the rebuilding of tourism infrastructure—important as it was—but how to bring back the tourists who had been scared away by the tsunami.⁵

Table 6: Hotel Industry Six Months after the Tsunami (Jan–June)

	Phuket			Phang Nga			Krabi		
	2005	2004	%	2005	2004	%	2005	2004	%
No. of Hotels	457	616	-26	55	149	-63	288	290	-1
No. of Rooms	29,150	30,965	-6	1,456	4,702	-69	8,737	9,867	-11
Occupancy Rate (%)	27	63	-57	31	56	-45	21	51	-59
Duration (Day)	3.16	3.57	...	1.41	1.66	...	1.94	2.86	-1

Source: Tourism Authority of Thailand

The first quarter growth rate of 2005 turned out to be a robust 3.3 per cent, but the annual growth rate fell to 4.5 per cent, significantly lower compared to the 6.2 per cent growth achieved in 2004, and much lower than what was predicted by analysts.⁶ The current account recorded a deficit of \$6.4 billion in the first seven months of 2005, compared with a surplus of \$3.4 billion a year earlier.⁷ Inflation rose from 2.7 per cent in 2004 to 4.5 per cent in 2005 and the trade deficit widened to 8.5 per cent of GDP. The current account surplus of 1.7 per cent of GDP in 2004 turned into a 4.4 per cent deficit in 2005.

However, the downturn in tourism alone could not have caused the very large fall in the GDP growth rate. The tourism industry contributes only 6 per cent to Thai GDP and the six tsunami-affected provinces accounted for only 30 per cent of Thailand's total tourism income. The tsunami did not destroy all hotels (or the fishing industry) in the six provinces. Moreover, other tourist attractions on the east coast of the Gulf of Thailand remained intact and the industry as a whole proved to be resilient. But in 2005 the Thai economy was badly affected not only by the tsunami but also by drought, ongoing insurgency in the south, rising oil prices, and a slowdown of global trade. The main cause of higher inflation was high oil

⁵ Phang Nga suffered most in terms of destroyed hotels. Although the number of hotels in Krabi did not fall much, the number of rooms in operation was reduced by almost 12 per cent because some large hotels were badly affected.

⁶ JP Morgan thus underestimated the first quarter growth, while both JP Morgan and Morgan Stanley overestimated the annual growth rate.

⁷ This led the World Bank in November 2005 to reduce its growth forecast from 5.2 to 4.2 per cent, and the Asian Development Bank, also highlighting the role of tourism, warned that the current account deficit in 2005 would worsen further if tourist arrival numbers did not recover during the peak season in the last quarter of 2005 (ADB, 2005).

prices. The combined effect of these problems was reflected in a sharp deterioration in the trade and current account. According to several estimates, the tsunami was probably responsible for only a 0.3 per cent reduction in Thailand's GDP growth in 2005.

Thus the early predictions tended to exaggerate the immediate adverse economic impact of the tsunami on the Thai economy. Arguably, the overly pessimistic forecasts made in the immediate aftermath of the tsunami may have had the unintended consequence of eroding consumer and business confidence and depressing business activity, contributing to the aggravation of the economic slowdown.

5. REHABILITATION, RECONSTRUCTION, AND RECOVERY

In the immediate aftermath of the tsunami, relief and reconstruction became the focus of a massive national effort. As shown in Table 7, the overall government budget allocation for tsunami relief and reconstruction was nearly \$1.7 billion. The government set aside \$112 million for immediate tsunami relief, 76 per cent of which was allocated to emergency relief and mitigation measures in the six provinces. Around 14 per cent of the relief budget went to projects for reviving the tourism industry in the Andaman areas, 10 per cent for rehabilitation of natural resources, and a relatively small proportion (less than one per cent) for installing an early warning system. Subsequent rehabilitation measures were allocated an additional \$72 million.

The Thai government initially allocated only \$8.3 million to public infrastructure reconstruction. This relatively small budget reflected the low level of assessed damage to infrastructure.

The largest budget allocation was to provide assistance to large entrepreneurs by way of soft loans.⁸ Relief measures for large entrepreneurs included the Bank of Thailand's soft loans, which were extended to commercial banks for lending to large companies in the three provinces. These loans amounted to around 90 per cent of the total budget.

**Table 7: Budget Allocation for Tsunami Relief Classified by Measures
(as of 16 November 2006)**

Measures	\$ Million
Emergency measures	112
Relief measures for large entrepreneurs	1,487
Rehabilitation measures	73
Reconstruction of infrastructure	8
 Total	 1,681

Source: Tsunami Help & Recovery Information System (THRIS)

A \$75 million ten-year tsunami recovery fund was set up in February 2005. The fund was managed by Mutual Fund Corporation Asset Management and funded by the Government Savings Bank, the Stock Exchange of Thailand, and the Thai Bankers' Association. Tsunami-affected firms could get assistance either in the form of loans or by sharing equity

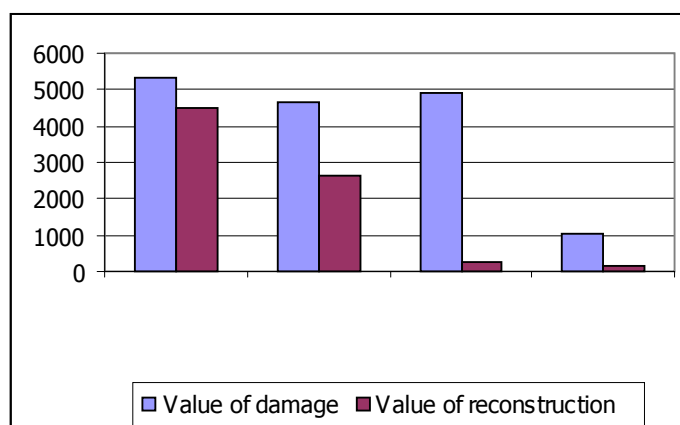
⁸ Note that some of these expenses may be subsequently recoverable in the form of paid-back principle and investment returns. In addition, these measures may yield subsequent tax revenues as they indirectly generate employment.

with the fund. As a precautionary measure, a ceiling of 350 million baht or less than 25 per cent of total assets of the fund was imposed for each project. The loans were made available at a 1 per cent interest rate for the first five years before reverting to market interest rates. The expectation was that reconstruction of hotels would be completed before the tourist high season at the end of 2006. In total, this fund amounted to around 6 per cent of total relief measures for large entrepreneurs.

5.1 Public Infrastructure

Figure 4 shows the actual expenditures on various categories of public infrastructure reconstruction compared with estimated values of damages in November 2006. In every category, the allocated funds exceed actual expenditures, suggesting that, at least until this time, the availability of finances has not been the critical constraint on reconstruction. Reconstruction activities are continuing, and, as will be discussed later, given that there are no major increases in construction costs, there is reason to be optimistic that infrastructure reconstruction will be completed without any major funding problems.

Figure 4: Infrastructure Damage and Reconstruction (\$ '000)



Source: Tsunami Help & Recovery Information System (THRIS), November 2006

5.2 Housing

Various government and private agencies were allocated responsibility for repairing or rebuilding houses in each province. Households could also opt to get \$750 in aid to rebuild their own houses. As shown in Table 8, residential house construction is largely completed.

In Satul, where housing damage was small, the local government took on the house building responsibility, while in Trang, where there were only 39 requests for new houses, the National Housing Authority undertook the task. Private companies were allocated the rebuilding of 127 new houses in Phuket. In Ranong, the Air Force took care of building 167 houses while the Defence Ministry took charge of building 375 houses in Krabi. The Army and the Navy were responsible for completing the construction of 2,850 houses in the worst damaged area, Phang Nga.

Table 8: Housing Reconstruction/Repairs

Province			New houses	
	Destroyed unit	Damage unit	Demand	Completion
Krabi	396	262	375	375
Phuket	742	291	127	127
Phang Nga	1,904	604	2,850	2,850
Trang	34	156	39	39
Ranong	224	111	167	167
Satun	2	80	-	-
Total	3,302	1,504	3,558	3,558

Note: 552 households opted for \$750 in aid to rebuild their own houses.

Source: DDMP (who reported the damage data on 15 February 2005. Rates of completed construction data were reported in June 2006).

However, as we shall discuss later, although the physical demand for new houses has been met, villagers who moved into these new houses are not always entirely happy with their new living quarters.

5.3 Cost Escalation

An interesting feature of Thailand's reconstruction experience is the fact that the physical reconstruction effort had little discernible effect on increasing construction costs. In fact, construction costs declined during 2005. This contrasts sharply with the experiences of Indonesia and Sri Lanka.⁹

The reconstruction activities certainly increased demand in the affected regions for construction materials and labour. This was seen in the opening of a large number of construction material shops in the affected areas. However, higher demand did not lead to price increases. Here it is important to note that the tsunami-affected areas were not very far from the metropolitan Bangkok region, and the overall reconstruction activity was small relative to the size of the Thai economy. What was particularly important was that the higher demand came in the context of a depressed construction sector at the national level, reflecting the overall slowdown in economic activity, which was tending to push prices down. There was considerable excess capacity in the main input markets for construction. Substantial excess capacity in the steel industry led to declining prices of steel products used in construction, while prices of wood and wood products rose less than five per cent over prices in December 2004. Even though higher oil prices exerted some upward pressure on most materials, prices of essential raw materials such as cement and steel remained subdued during the reconstruction period. Overall, the magnitude of the demand effect was not sufficient to increase prices because there was an elastic supply of construction inputs.

5.4 Livelihoods

The second-round effect of the tsunami hit when victims lost their livelihoods. This occurred either because capital equipment used in their jobs was destroyed (as in fisheries) or because they lost jobs in the tourist sector due to hotels being damaged or cutting employment following falls in tourist numbers (even though some workers were willing to accept pay cuts to keep their jobs).

⁹ See Nazara and Resosudarmo (2007) and Jayasuriya, Steel, and Weerakoon (2006).

The government addressed the plight of unemployed workers through various employment programs (Table 9). The employment project, averaging an expenditure of \$130 per person, was the most active program set up to generate short-term livelihood support; as of November 2006, it had cost around \$3 million and benefited almost 24,000 workers. In terms of total expenditure, the second most important project for the unemployed was the job training project, which cost \$43 per head. However, unemployment was expected to be essentially short-term, and it is not clear whether workers temporarily displaced from their normal occupations (tourism industry, fisheries, etc.) were likely to gain much benefit from training for alternative occupations. The job creation project had the highest cost per head (\$254) but could accommodate fewer than 1,000 workers, while the project supervised by the Department of Labor and Welfare Protection spent only \$30 per head.

Table 9: Thai Government Support to Unemployed Workers

	Total (December 2005)	Total (November 2006)	Budget per head 2006
Employment project			
Budget (\$)	2,809,057	3,109,741	130
Number of beneficiaries	22,000	23,958	
Job provision			
Budget (\$)	10,043	10,043	0.40
Number of beneficiaries	23,000	23,000	
Labour transferring service			
Budget (\$)	8,765	8,765	7
Number of beneficiaries	1,200	1,200	
Job creation project			
Budget (\$)	222,152	237,522	254
Number of beneficiaries	760	936	
Job training project			
Budget (\$)	1,095,650	1,097,270	43
Number of beneficiaries	10,000	25,751	
Department of Labor Protection and Welfare			
Budget (\$)	980,286	1,023,567	30
Number of beneficiaries	28,340	34,340	
Total			
Budget (\$)	5,125,953	5,486,908	50
Number of beneficiaries	85,300	109,185	

Source: Tsunami Help & Recovery Information System (THRIS), 23/11/2006

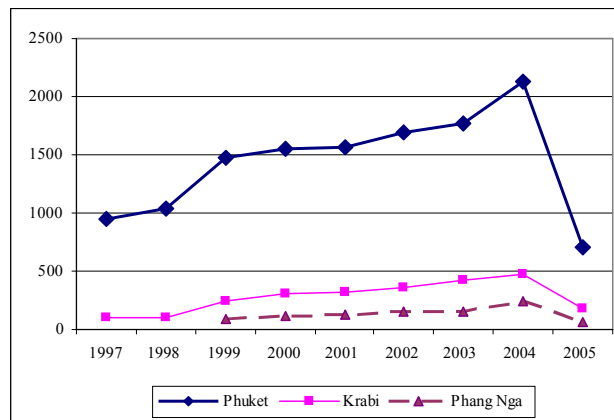
5.5 Impact on the Tourism Industry

The key industry in terms of employment and livelihoods was the tourism industry. It had been on a steady growth path prior to the tsunami, except in 2003 when the industry suffered from an Avian-influenza scare. Revenue from tourism in Phuket, Krabi, and Phang Nga had been increasing steadily. But the December 2004 tsunami sharply interrupted this growth trend. Following the tsunami, revenues fell dramatically in 2005 (Figure 5).

The primary reason for the drop in tourism was not actual physical damage to tourism infrastructure but the reluctance of tourists to visit. Phuket suffered the steepest fall despite the fact that its hotels were less damaged than in the other two provinces. The number of tourists in Phuket dropped sharply in January—when there was almost no tourists—and

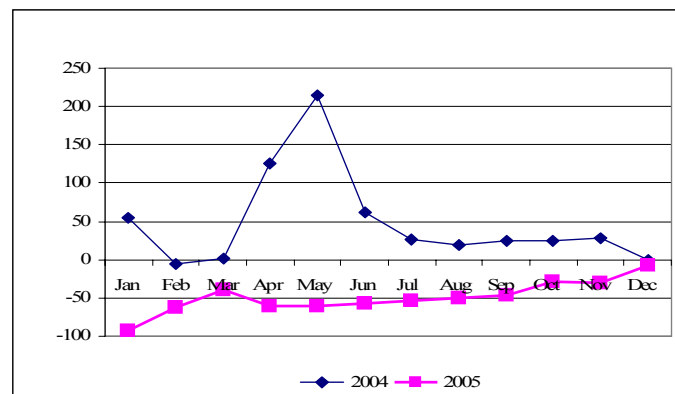
continued to be low throughout 2005 (Figure 6). The drop in tourism led to considerable unemployment in these areas.

Figure 5: Tourism Revenue in the Three Tsunami-hit Provinces (million \$)



Source: Tourism Authority of Thailand

Figure 6: International Tourist Arrivals: Phuket Airport (Percentage change year-on-year)



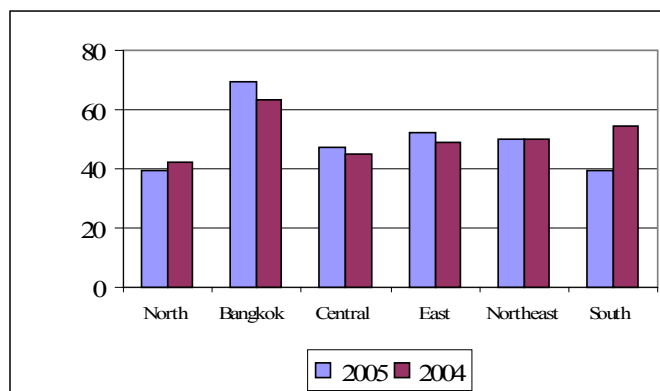
Source: Tourism Authority of Thailand

It is important to note here that the falls in tourism in the affected regions were to some extent compensated for by increases in tourist arrivals in other parts of the country. Fortunately, only a small portion of Thailand’s hotel industry was seriously affected by the tsunami as there are other beaches in different parts of Thailand, particularly along the Gulf of Thailand, which are reasonable substitutes for those of the Andaman areas. Tourists could also switch to the northern part of Thailand.

The consequence was that while there may have been a significant decline in the hotel occupancy rate in the south, there were increases in occupancy rates in other parts of the country—particularly in Bangkok (Figure 7). The result of the substitution of the Gulf of Thailand for the Andaman coast as a tourist destination can be seen by the tourism boom in Koh Samui and some other resort areas on the east coast of Thailand. In 2005 the hotel occupancy rate in Pataya grew by 28 per cent. The result was a boom in demand for land in these alternative tourist destinations. By March 2006, the land price in Koh Samui had gone up nearly sevenfold from 37,500 to 250,000 baht per rai (0.625 hectare). Hotel chain

operators and investors drove up property values as the demand for hotel accommodation in these areas exceeded available supply.

Figure 7: Hotel Occupancy Rate (per cent)



Source: Tourism Authority of Thailand

However, tourist numbers to the tsunami-affected areas began to increase in 2006 and two years after the tsunami the tourism industry is close to completely regaining its earlier level of activity. Airlines that cancelled flights to Phuket after the tsunami have returned, including those from Australia, the Republic of Korea, Singapore, and Europe. In addition, new airlines have started direct flights to Andaman areas. In the second half of 2006, Hong Kong Express started to operate two flights a week from Hong Kong, China to Phuket. China Rich Airways began two flights a week from Hong Kong, China direct to Krabi in August. Thai Airways International resumed twice-weekly flights from the Republic of Korea to Phuket in an attempt to encourage high-end Korean tourists to return to Phuket and nearby spots like Krabi, and Koh Samui. Targeted tourists included golfers, spa visitors, honeymooners, and families. Phuket's private sector went on a road show to attract tourists from new markets in India, the Middle East, and Russia. These private sector initiatives have helped the industry to recover within a year of the disaster.

The return of many airlines and the arrival of new airlines indicate a solid recovery of the tourism industry. Another indicator of the rapid recovery of the tourism industry is the low level of non-performing SME loans. The SME Bank reported in March 2006 that 523 business operators had borrowed special loans totalling 19 million baht from the SME banks. These were special loans of less than 500,000 baht with a repayment period of three years at a concessionary interest rate of 2 per cent per year. Thirty-one operators had repaid all their debt, a total of 10 million baht, within one year. All borrowing enterprises paid interest on schedule.¹⁰

5.6 Damage to Coral Reef

There were initial fears about the impact of the tsunami on the coral reefs, a precious natural resource important for the tourism and fisheries industries and for the wider eco-system. However, according to the Phuket Marine Biological Center, the giant tsunami waves damaged only those coral reefs in shallow waters, meaning that only 5 per cent of the coral reef in Phuket was destroyed. Moreover, some corals, "branchy" corals, are expected to recover within three years, while "bunchy" corals should recover within ten years. Hence there seems to be no serious long-term damage to the quality of coral reefs. However, the

¹⁰ Ironically, the SME Bank has the highest rate of non-performing loans among financial institutions in Thailand—at 35 per cent of total outstanding loans amounting to 16 billion baht in 2006.

Food and Agriculture Organization (FAO) has warned that there could be other long-term negative impacts on the coastal ecosystem. The dense mangrove forests hit by the tsunami have been damaged, and the freshwater swamp forests were also destroyed by saline water intrusion. These need rehabilitation to ensure the long-term sustainability of the eco-system and protection from future disasters (FAO 2005).

5.7 Tsunami Warning System

On 26 December 2004 the Pacific Tsunami Warning Center detected the massive earthquake that triggered the tsunami and warned of the approaching giant waves but there was no official alert system in the region. There is now widespread recognition that an early warning system is an essential part of preparations for coping with future disasters. The National Disaster Warning Center (NDWC) has an agreement with the Asian Disaster Preparedness Center (ADPC) to exchange real-time data from sea-level observations and seismic monitoring systems. Cooperation among countries in the Andaman region to share information and maintain the system can provide a valuable public good that can save lives and mitigate unwarranted fears of future tsunamis. In early December 2006, a “Deep Ocean Assessment and Report of Tsunami” (Doart) buoy costing \$5 million was installed in the centre of the Andaman Sea, 1,100 kilometres west of Phuket and 925 kilometres east of India.¹¹ The deep-sea buoy can detect tsunami waves and send signals from the buoy to warning centres in eight countries in the region. The NDWC is responsible for alerting the public in Thailand after receiving a signal from the buoy.

The high-tech network of sensors and buoys will not be effective, however, if there is no effective communications link to the coastal communities that might be hit by a future tsunami. In an effort to build up an “alert system” in local communities, the Public Works Department completed the construction of 55 tsunami warning towers by June 2006 in the six provinces: 16 in Phang Nga, 12 in Krabi, 9 in Trang, 13 in Satul, and 5 in Ranong. The construction of ten warning towers along the Andaman coast is planned by local administrations. The total budget for the construction of the towers is less than 1 per cent of the total budget for the warning system, reflecting the capital intensive approach of the installed system.

The extent to which this warning system will build confidence among village communities and tourists is unclear. Observation towers and signs pointing out escape routes may generate a confidence among villagers and tourists that they will be warned in advance of tsunamis. It remains to be seen whether tourists, encouraged by this warning system, will feel safer and will return to these locations.

6. AID AND ASSISTANCE

Though Thailand was not as severely affected as Indonesia or Sri Lanka, it attracted particularly strong international media attention because of the very large number of foreign tourists who were caught up in the tragedy. Furthermore, the areas hit by the tsunami included famous tourist destinations. Thus, Thailand was inundated with offers of assistance from governments, multilateral donor agencies, corporate and community groups, and individuals. Philanthropy was shown to exist among both large and small corporations, and among both the rich and the poor.

The immediate response to the disaster can be considered a success, but poor coordination among aid donors hampered effective delivery and distribution. There were many instances

¹¹ The NDWC paid six million baht to the Navy to install the buoy and patrol the area to prevent approaching vessels from getting too close to the beacon.

of wasteful aid. Some donations of food and clothes were wasted because they were not appropriate for Muslims. Some houses constructed by the military were not appropriate for the lifestyle of fisher folk. Many of the inefficiencies in aid programs reflected the problems of supply-driven assistance, ignoring the particular needs of the victims.

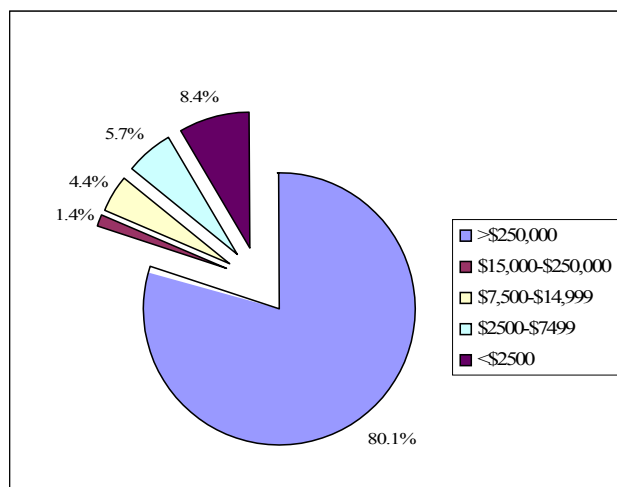
The Thai government turned down offers of financial assistance from foreign governments, including offers of debt relief from Europe, though it accepted technical assistance. The rationale given was that Thailand wanted funds to be given to other countries in more difficult circumstances, such as Indonesia. It is also likely that the government wanted to send a message to the global investor community concerning its financial stability, fearing that acceptance of debt relief might hurt Thailand’s credit rating and thus raise Thai borrowing costs and discourage capital inflows.

6.1 Foreign Assistance

However, as seen in Table 10, following the tsunami Thailand received significant assistance from a range of foreign donors. This assistance included technical assistance from foreign governments. The total amount of aid committed was \$131 million, ranging from contributions of \$5,000 to \$27 million. This foreign commitment was around 10 per cent of Thailand’s tsunami-related budget. The government also received substantial donations from the corporate sector, estimated at \$50–60 million in 2005 (Bernhard et al., 2005).¹² This amount is quite substantial when compared with the amount contributed by international donors. Nearly all large foreign companies operating in Thailand provided some type of contribution within a short period following the disaster.

Figure 8 shows that 80 per cent of the total amount donated came from donations larger than \$250,000. These larger donations came primarily from large organizations and corporations. Contributions of less than \$25,000 accounted for about eight per cent of total contributions.

Figure 8: Donation Classified by Size



Source: Tsunami Help & Recovery Information System (THRIS)

¹² Bernhard et al. (2005) have argued that the Thai government’s rejection of official aid from other countries may have encouraged corporate donors to make a larger contribution.

Table 10: Contributions from International Donors (\$)

International Partner/DAD Project Code	Committed (\$)	Disbursed (\$)	Disbursement (%)
Adventist Relief and Development Agency (ADRA)	540,000	540,000	100
The Asia Foundation	543,125	523,250	96
AusAID	773,054	773,054	100
Canadian Food for the Hungry	76,860	76,860	100
Danida	3,164,481	1,418,669	45
Department of Foreign Affairs and Trade (DFAT)	12,200,000	12,200,000	100
Embassy of Italy	1,234,568	1,234,568	100
Entraide et Solidarite	125,000	122,500	98
FFEM (Fond Francais pour l'Environnement Mondial)	27,407,407	-	...
France	75,000	75,000	100
Francois-Xavier Bagnoud Foundation	5,000	4,000	80
French NGO	67,901	67,901	100
French Red Cross	25,000	25,000	100
Friedrich Ebert Stiftung	6,173	6,173	100
GTZ	1,052,632	394,737	38
Heart Doctors	66,667	-	0
IOM (International Organization for Migration)	226,579	130,204	57
International Labour Organization	807,000	687,720	85
Municipality of Issy-Les-Moulineaux	49,250	49,250	100
National Polytechnique Institute of Toulouse	14,720	14,720	100
Norway	7,911,300	7,911,300	100
Office for Coordination of Humanitarian Affairs (OCHA)	466,211	103,711	22
PMU-Interlife	53,050	-	0
RAID (French Police)	27,500	27,500	100
Solidarites	50,933	-	0
Swiss Agency for Development and Cooperation SDC	2,294,083	1,268,011	55
Terre des Hommes - Italy	723,684	-	0
The Sustainable Tourism Development Consortium (STDC)	1,181,102	1,181,102	100
The Australian Federal Police (AFP)	3,073,452	3,073,452	100
The Austrian NGO Hilfswerk, Austria	811,462	-	0
UN OPS	152,000	152,000	100
United Nations Children's Fund	9,750,000	9,750,000	100
United Nations Development Programme	5,185,418	5,185,418	100
United Nations Educational, Scientific and Cultural Organization	60,000	10,000	17
United Nations Population Fund	869,800	769,800	89
United Nations Programme on HIV/AIDS (UNAIDS)	15,000	15,000	100
United States Agency for International Development	21,096,000	3,000,000	14
World Bank	4,850,000	4,850,000	100
World Food Programme	500,000	500,000	100
World Health Organization	3,000,000	3,000,000	100
World Vision	20,000,000	7,000,000	35.0
World Vision Canada	1,455,372	1,455,372	100
Total	131,986,784	67,596,272	51

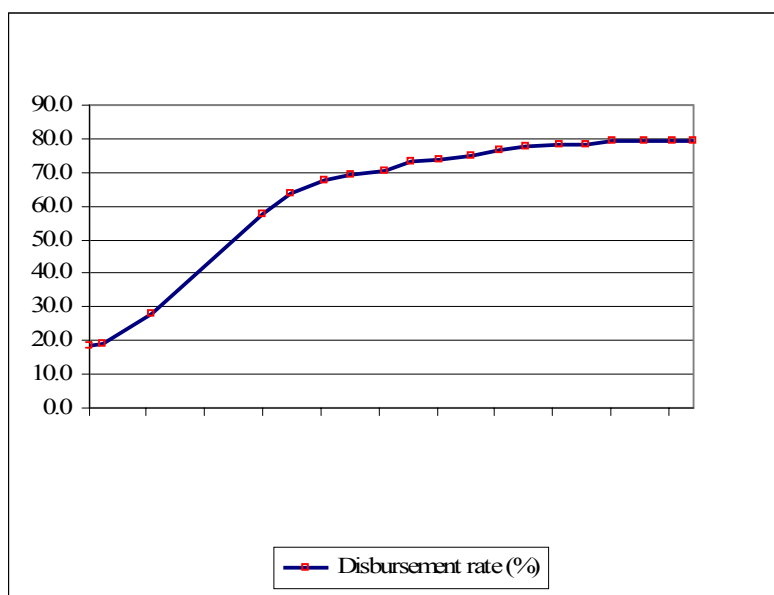
Source: Thai International Cooperating Agency (TICA)

6.2 Delivery of Assistance: Speed and Efficiency

Emergency assistance to the tsunami victims was delivered quickly. Government officials and volunteers were able to reach affected areas immediately after the tsunami because basic infrastructure was not totally damaged and access to affected areas remained open. Moreover, relief agencies and individuals were able to reach disaster areas without having to obtain prior permission from provincial governments.

In the early phase of relief, aid disbursement was rapid. As shown in Figure 9, disbursement was 20 per cent of the total fiscal budget within two months of the disaster. The rate went up to 70 per cent by the end of the first year, an acceptable rate in the circumstances. However, disbursement in the second year slowed down and it seems that by the end of 2006 it may not have been higher than 80 per cent.

Figure 9: Disbursement of Tsunami Aid



Source: Office of the Prime Minister

Of course some types of financial assistance should and can be spent faster than others. This is seen in Table 11, which shows the disbursement rates of government funds in various expenditure categories. For example, funds allocated to provide assistance to foreign tourists (medical care, helping those who lost their belongings, helping them to return home, and so on) were completely disbursed and utilized. On the other hand, assistance to students—less urgent—had the lowest disbursement. Disbursement was also slower for assistance to fishers.

The disbursement rate of foreign pledges varied a great deal. As of November 2006, the disbursement was only 50 per cent. Some pledges (Table 10) had not been disbursed at all. Larger donations with commitments of \$20 million or more (e.g., FFEM, USAID, World Vision) seem to have had a slower disbursement rate. It is not surprising that large donations tend to have a slower rate of disbursement, because the objective of the pledges was to achieve longer term rehabilitation. Further, speeding up the disbursement of the large amounts of money with no effective monitoring and careful evaluating system would have created problems of accountability. Zero disbursement rates were related to small amount of donations.

Table 11: Financial Assistance Provided by the Thai government

	Sub-Committee on Assisting	PM Office Assistance Fund and Central Budget (\$ mil.)	Amount disbursed (\$ mil.)	Disbursement (%)
1	Foreign tourists	2.2	2.2	100
2	Affected victims	20.5	19.5	95
3	Affected fishers	20.7	14.5	70
4	The unemployed	5.3	5.4	97
5	Small vendors	5.3	5.2	99
7	Accommodation	2.5	2.3	89
8	Affected students	21.3	11.3	53
	Total	78.1	60.4	77

Source: Office of Prime Minister Website, November 2006

6.3 Aid Delivery: Equity Issues

Issues have arisen over the manner in which assistance has been distributed. As previously discussed, damage of fisheries accounted for about 12 per cent of total damage, and various organizations contributed compensation that amounted to 32 per cent of total fishery damage. However the distribution of compensation did not correspond to the actual damages. Fishers in Phang Nga, who suffered 50 per cent of the total damage, received only 30 per cent of the total value of aid. In contrast, Satul's share of damage was only 6.6 per cent, but it received 39 per cent of total compensation. Krabi fisheries, with 65 per cent of total compensation, also received much more than their fair share. It may be noted here that Phang Nga is the home of minority ethnic groups that may not be given the highest priority. In addition, some of them had not obtained Thai citizenship or necessary documents. Uneven disbursement can also be due to allocation of budgets by central and local governments among affected provinces.

Arguably, there may be a similar issue with regard to the allocation of loans extended to firms to help revive businesses. Large hotels that suffered heavy losses received government subsidies in the form of loans at concessionary rates; in total, such enterprises received financial injections of over \$1 billion (Table 12). In contrast, around 10,000 small and medium enterprises (SMEs) received a total of around \$5 million. It is not clear what criteria were employed in deciding the allocation of funds between large enterprises and SMEs, whether this was the best means of helping to revive the tourism industry of the Andaman coast, and whether the marginal product of capital injected into large enterprises is higher than that of SMEs. The employment effect of assisting SMEs versus large enterprises, too, is a factor to be considered.

Table 12: Financial Assistance to Enterprises

Large enterprises	Unit	\$ mil.
Soft loan	7,014	997
Financial institution credit	2,068	31
Mutual fund	36	60
Social security fund	6	2
Total	9,124	1,089
SMEs		
Financial aid	10,718	5

Source: Tsunami Help & Recovery Information System (THRIS), 23/11/2006

6.4 Public Assistance, Insurance, and Credit Markets

This raises a wider and longer term issue about the impact of public sector provision of compensation and assistance to business enterprises on how such enterprises will behave in terms of obtaining private insurance for disasters. Kunreuther and Pauly (2006) show that public disaster assistance is a form of insurance that is suboptimal when compared to insurance purchased before the disaster. Firms maximize expected profits by taking into account insurance premiums and the expected extent of public assistance. Mandatory comprehensive private disaster insurance with risk-based rates can help minimize costly and poorly targeted disaster assistance. An *ex ante* public coverage program to cover catastrophic losses and to subsidize insurance coverage for small and medium firms can be more efficient than costly *ex post* relief programs. From a public policy perspective, preparations for disasters should involve assessments of how disaster insurance markets can be developed and how private firms can be induced to invest in disaster insurance.

In this context, policies to cope with natural disasters need to address issues raised by the underdeveloped nature of financial and capital markets in developing countries and the restricted access of the poor to such markets. Natural disasters typically hit the poor hardest. Those engaged in small and microenterprises, including craftspeople, small shopkeepers, and fisher folk, require credit to replace their equipment and inventories to re-start businesses. In this context, microfinance appears to have a major role to play. However, the Grameen Foundation USA, which looked into the availability of microfinance in the tsunami-affected areas, did not find NGOs or other organizations offering micro-lending services. The Foundation believes that poverty hindered the development of effective microlending initiatives, particularly in the south (Counts et al., 2005).¹³ We revisit this issue below.

6.5 Assistance to Children

Thousands of children lost both of their parents and became orphans following the tsunami. The Thai government provided financial aid to almost 1,500 orphans and almost 27,000 other children (Table 13). Most of those orphaned were from the six affected provinces; some were from other locations whose parents had been working in the tsunami-hit areas. The government provided the orphans with clothes and educational materials, including scholarships through to university level. The response of the government in terms of providing access to education was strong and swift. Most schools were able to re-open almost immediately (on January 4, 2005). Children's attendance was initially low, but soon returned to pre-tsunami levels. For those children, particularly the orphans, the impact of the

¹³ There are a number of microfinance organizations operating in Thailand, including the Small Enterprise Development Corporation, which serves 15,000 clients in the northeast region of Thailand. Coleman (2006) found that microcredit may not reach the core poor of northeast Thailand because wealthier villagers participate more than the poor and become committee members who borrow significantly more than rank and file members.

tsunami will obviously not be confined to the short-term. Recognizing this, psychological support was provided through a broad community-based psychosocial recovery program to mitigate the negative impact on children's learning.

Table 13: Financial Assistance from Thai Ministry of Education

Province	Orphanage		Affected children	
	Number	Aid (\$)	Number	Aid (\$)
Krabi	119	73,800	5,577	2,091,050
Phang Nga	630	393,175	6,127	2,297,625
Phuket	177	110,625	2,608	977,675
Ranong	87	54,375	2,278	852,950
Satun	13	8,125	5,116	1,918,500
Trang	29	18,125	4,432	1,662,000
Other provinces	441	275,625	854	320,250
Total	1,496	933,850	26,992	10,120,050

Source: Tsunami Help & Recovery Information System (THRIS)

6.6 Assistance to Deal with Trauma and Stress

The impact of the tsunami was not confined to physical and economic losses. The trauma associated with loss of family members, relatives, and friends, as well as loss of physical assets and livelihoods, imposed heavy economic and psychological pressures on the survivors. It has been reported that some fishers, for example, have suffered from hallucinations and paranoia, and have been unable to go back to sea. Attempted suicides and symptoms of acute stress and other mental problems have also been widely reported (Table 14). These reports are given credence by the heavy demand for mental health services provided by the Mental Health Center for the Thai Tsunami Disaster.

**Table 14: Mental Health Services for Tsunami Victims
(26 December 2004–4 May 2006)**

Province	No. of services	Types of services		
		Psychiatric drugs	Counseling	Medical treatment
Krabi	3,664	839	3,799	1,114
Phang Nga	9,984	3,349	9,898	3,335
Phuket	2,600	634	2,669	833
Ranong	1,484	178	1,364	316
Satun	704	273	226	458
Trang	614	6	594	156
Total	19,050	5,279	18,550	6,212

Source: Mental Health Center for the Thai Tsunami Disaster

6.7 Social Tensions

Many disputes and conflicts threatened social cohesion in the affected communities and these may have aggravated trauma among affected communities. Many villagers, already depressed by misfortunes, faced disputes over land ownership. More than 20 per cent of affected villages experienced some land disputes. Many traditional owners—villagers and ethnic communities—do not have secure legal titles to their land. In the aftermath of the tsunami, many found themselves locked into disputes with local governments who wanted to maintain land for public use and to protect the environment and developers interested in obtaining prime land along pristine beaches for commercial purposes.

Conflicts have also arisen because of perceptions that assistance has not been equitably distributed. In the early phase of relief assistance, there was a strong emphasis on speedy delivery of aid, which sometimes meant that some needy people missed out on assistance. For example, in some cases when the aid distributors arrived in a village, some people did not receive assistance because they were elsewhere searching for their family members. Irrespective of the reason, for people already traumatized by the disaster perceptions of unfair treatment tended to exacerbate community tensions.

7. COMMUNITY PERCEPTIONS AND BEHAVIOUR: RESULTS FROM A FIELD SURVEY

An important part of this study was a field survey of affected communities in the three most severely affected provinces. The motivation for this survey was to understand behavioural adjustments of families affected by the tsunami, so as to be able to draw lessons of wider relevance for policy formulation for natural disaster management.

Primary data was obtained from a sample survey of 262 displaced and non-displaced individuals, 37 visitors (tourists), and seven NGOs. The survey was designed to gain insights into aspects of the disaster management process as seen from the viewpoint of affected communities, tourists, and non-governmental agents such as NGOs. In particular, we were interested in obtaining community perceptions regarding the effectiveness of aid in terms of availability, distribution, speed, and targeting among various groups of occupations, and whether assistance may have adversely affected incentives for self reliance by creating an “aid-dependency” syndrome.

7.1 Survey Methodology

The survey was conducted in June 2006. It covered the three provinces severely affected by the tsunami and included 296 respondents. There were eight individual sample categories: Diversified Households' (H) Fishers (F), Entrepreneurs (dependent mainly on tourism) (E), Labourers (L), Beach Vendors (B), Tourists (T), and Moken (an ethnic minority tribe of 'sea gypsies' who comprise a small fishing community in Phang Nga) (M), as well as seven NGOs from Phang Nga province. The sample distribution by province and category is given in Table 15. Sample size in each province was roughly proportional to the loss of life in each province, taken as an indicator of the severity of the tsunami impact. In each category, sample size was determined to obtain a reasonable size and cross section conditional on the overall budget for the survey, and the group sample sizes do not strictly correspond to their proportions in the population.

Table 15: Survey Sample: Composition and Distribution

	Phuket	Phang Nga	Krabi	Total	%
Diversified					
Households (H)	6	53	13	72	24
Fishers (F)	8	23	5	36	12
Entrepreneurs (E)	11	17	8	36	12
Laborers (L)	11	17	8	36	12
Beach Vendors (B)	11	17	8	36	12
Tourists (T)	11	18	8	37	12
NGOs	0	7	0	7	2
Moken (M)	0	36	0	36	12
Total (numbers)	58	188	50	296	
Per cent (%)	20	64	17		100

The families included in the Diversified Households group had family members engaged in a variety of occupations, including general service providers, fishers, housewives, and traders. Thus, while some of these household members follow occupations similar to those of the main income earners in the various occupational categories, the households as a whole have more diversified income sources. Twenty-three fishery households (Fishers) were randomly selected from Phang Nga, eight from Phuket, and five from Krabi. Those in the Entrepreneur category were mainly small business operators involved in tourism-related businesses such as restaurants, shop houses, and guest houses. The Labourer category includes those who were employed in hotels, restaurants, shop houses, department stores, and local administration. Beach Vendors provide various services to tourists on the beach, such as renting out beach umbrellas and chairs and selling food. The activities of NGOs have been concentrated primarily in Phang Nga, where the need for assistance was deemed to be strongest. The sample was drawn entirely from that province. We wanted to ensure that the NGOs could provide their own perspective to balance that provided by community groups. The Moken are fisher folk who also provide construction labour and engage in petty trade. They were included as a specific category in the survey to assess their perceptions as an ethnic minority group regarding any bias or discrimination in the provision of assistance.

Overall the sample was reasonably gender balanced (52 per cent males, 48 per cent females) but there is considerable variation among different groups. There were significantly more male respondents than females in the Fisher and Labourer categories (81 per cent and 58 per cent respectively) while there were more females within the Entrepreneur (64 per cent) and the Moken categories (56 per cent). In other categories (Diversified Households and Beach Vendors) the gender numbers were approximately equal.

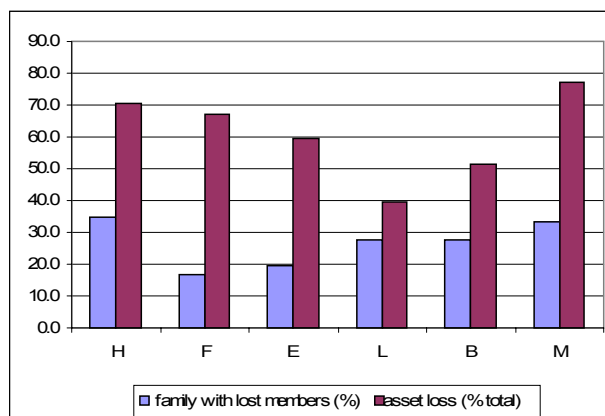
Half of the surveyed Entrepreneurs and around a third of Diversified Households and Beach Vendors were new migrants to these areas, in contrast to nearly 80 per cent of the Fisherman and almost all of the Moken being natives of these areas.

7.2 Tsunami and Asset Losses

Information gained from survey respondents provided a household-level perspective on how the tsunami affected households (Figure 10). Some families in each group had lost family members, while most lost some assets. The way in which affected families have adjusted to post-tsunami life and coped with the many economic and non-economic challenges they have had to face have been conditioned by these two, key, traumatic driving forces: loss of family members and asset destruction. We will relate the adjustment and coping strategies

of families to these two driving forces. Respondents were asked to approximate the damage on their property as a percentage of their total assets. In relative terms, Moken were the worst affected by asset losses, losing almost 80 per cent of their total assets. Laborers lost 40 per cent of their assets. In our sample, less than 20 per cent of Fisher families lost family members—the lowest rate among the six groups—but Fishers were hit hard by asset losses.

Figure 10: Death and Destruction



7.3 Adjustment and Coping with Post-Tsunami Reality

Table 16 presents information about how families adjusted to the loss of incomes and livelihoods after the tsunami. Eighteen months after the tsunami, the incomes of the large majority of families (68 per cent) were below their pre-tsunami level, while a small minority (15 per cent) experienced an increase in income level.

Table 16: Income Changes and Patterns of Adjustment by Category (%)

	Diversified Households (H)	Fishers (H)	Entrepreneurs (E)	Laborers (L)	Beach Vendors (B)	Moken (M)	Total
Lower income	69	72	86	64	92	53	68
Unchanged income	15	17	6	6	6	36	17
Higher income	15	11	8	31	3	11	15
Total	100	100	100	100	100	100	100
Borrowed money	54	58	53	44	53	19	48
Changed occupation	42	36	31	47	33	31	39

But significant differences were found within the sample categories. Those who depended heavily on incomes from tourism were the hardest hit: 92 per cent of Beach Vendors and 86 per cent of Entrepreneurs experienced a decrease in income, followed by Fishers (72 per cent) and Diversified Households (69 per cent). Surprisingly, the Moken minority suffered the least from the reduction in income. Only a little over half of them experienced a decline in income level, 36 per cent of them were able to maintain the same level of income, and 11 per cent actually earned higher incomes. While 64 per cent of families belonging to the

Labourer group had lower incomes, some 30 per cent reported that their incomes were higher.

More insights into the reasons for these different income level experiences can be gleaned from the ways in which families adjusted their income-earning activities after the tsunami. Overall, 40 per cent of the sample reported that they had changed their main occupation. The largest proportion of those who changed jobs was in the Labourer group of whom nearly half took up a new occupation. In contrast, only 30 per cent of Entrepreneurs and the Moken changed occupations.

A variety of factors to do with occupational skill-specificity, adjustment costs, and alternative job opportunities appear to have been important. Many Entrepreneurs probably felt that they were able to cope with a temporary income shortfall based on the expectation that tourist arrivals would recover before long. For the Moken, many of them were not only less dependent on markets for their incomes, but with limited skills, may have also had fewer opportunities to move into other jobs.

7.3.1 Consumption Smoothing and Access to Credit

A shock like the tsunami can be thought of as a temporary negative shock that reduces income for a period of time. Of course if significant asset damage also occurs, then there is a longer-term impact that reduces household wealth. However, the large scale assistance programmes generated a perception that asset damages would be more or less fully compensated through government and other donor aid. An expected response to income reductions, particularly when the decline is expected to be temporary, is an increase in borrowing as families attempt to smooth their consumption.

In the post-tsunami period, despite the availability of some aid and assistance, nearly half of all households across the different categories went into debt. However, though over half of the Moken families experienced an income fall, less than 20 per cent of them went into debt. In contrast, the number of families who borrowed was highest among the Fishers. It is possible that some families who wanted to borrow may have been unable to access credit markets and thus became liquidity-constrained. This is particularly likely to be the case for those who were asset poor and hence unable to borrow because of lack of collateral. Arguably, most Fishers expected that their assets and equipment would be replaced and hence expected that their income levels would recover after some time. This expectation may have been shared by many lenders. On the other hand, many Moken families were more likely to be liquidity-constrained because they were probably not seen as good credit risks and hence were more likely to have been denied access to credit. Further research is required, however, before any firm conclusions can be reached.

7.3.2 Determinants of Loan Demand

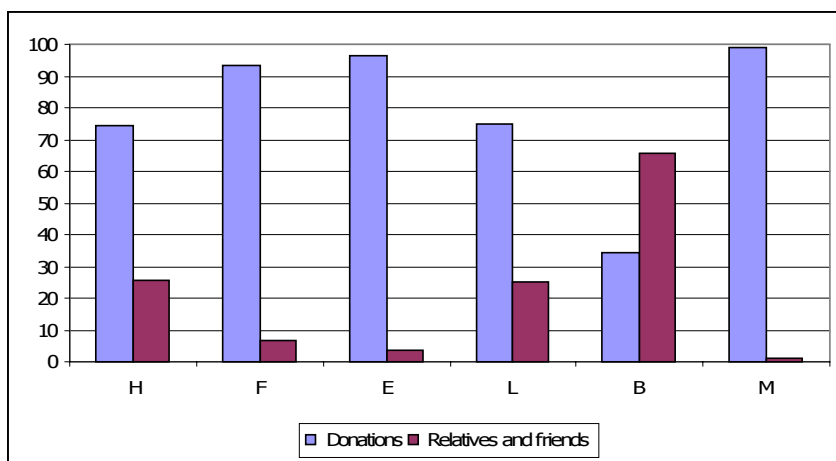
We further explored the demand for credit within households using a model where the demand for credit (amount of borrowing) was considered to depend on the following factors: the pre-tsunami monthly income (YB) multiplied by the number of months of unemployment (to proxy the income gap needed to maintain the pre-tsunami expenditure level), the cost of borrowing or the interest rate, the loan purpose (business or non-business), the availability of collateral, and the total amount of financial aid (TOTAL-AID) obtained from direct aid, relatives and friends. The detailed results are given in equation (1) in the Appendix.

The results indicate that credit demand is positively related to direct aid amount, availability of collateral, and whether the loan is for business purposes, and (as expected) negatively related to the interest rate. It is interesting that the total cash aid received complements rather than substitutes for total credit demand. The significance of the availability of collateral

as a determinant of credit demand indicates that tsunami victims who have suffered loss of assets, and thus loss of adequate collateral, are likely to be liquidity-constrained. Poorer households with no collateral are also likely to be forced into the informal credit market where interest rates are higher. Such high-interest credit raises the cost of credit and thereby further reduces the capacity of the asset poor households to use the credit market for consumption smoothing. In this context, effective microfinance programmes can play an important role by providing credit to restart microenterprises to those who cannot afford the high interest loans.

Financial assistance from friends and relatives—from social networks—can be very important for cash-strapped tsunami victims experiencing income shortfalls. In our survey assistance from friends and relatives accounted for about a third of total financial assistance to households (Figure 11). However, this was not evenly spread across the different household categories.

Figure 11: Sources of Financial Support (% of total financial support)



Beach Vendors received the bulk of their financial assistance from relatives and friends, while Diversified Households and Labourer households received about a third of their total assistance from relatives and friends. On the other hand, outside assistance was by far the most important source for Moken and Entrepreneur households. In the case of Entrepreneurs, it is possible that this low proportion of financial assistance from relatives and friends was related to several factors: their need for handouts from friends and relatives to meet living expenses may have been lower; they had better access to savings; and credit markets and outside agencies, including the government, may have provided large scale assistance to restore business assets destroyed by the tsunami.

The Moken community was in a very different situation. If families and friends were also affected by the disaster, or if their friends and relatives were quite poor anyway, their capacity to help each other would be constrained. In this context, being a migrant may have been an advantage because it meant some chance of assistance from relatives and friends living at a distance and unaffected by the tsunami. In fact, after the disaster, the Moken community seems to have recognised the value of being more integrated with the broader Thai society. Moken people have obtained Thai citizenship and thereby have better access to formal education for their family.

Households whose livelihoods have been badly hit by a disaster can seek alternative employment, provided such employment opportunities exist or emerge after the disaster. As Table 16 showed, a significant number of households changed occupations. In Table 17, we

examine the degree to which changes in occupations enabled maintenance of income levels within different household groups. Most households were forced to accept lower incomes whether or not they remained in the same occupation. This does not mean that changing jobs was of no benefit; those who changed jobs did so because the alternative would have been an even lower level of income or unemployment, and the cost of changing jobs was more than compensated for by the expected earnings in the new occupation.

Table 17: Changes in Income and Occupations (%)

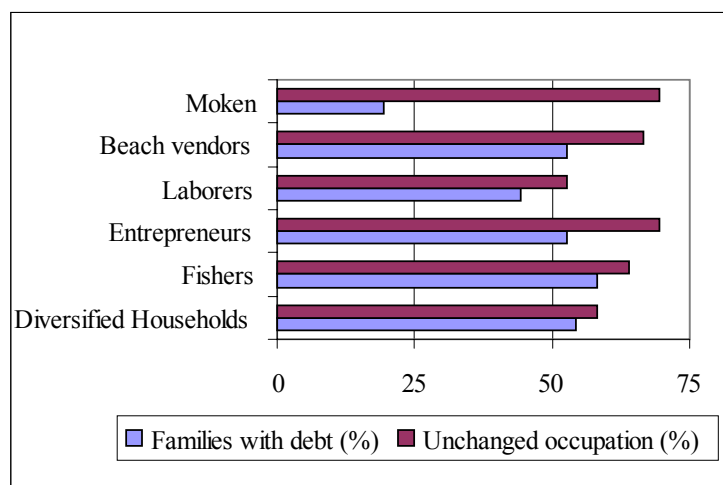
New occupation						
Income	Diversified Households (H)	Fishers (H)	Entrepreneurs (E)	Laborers (L)	Beach Vendors (B)	Moken (M)
Decline	72	85	83	94	77	42
Constant	15	8	8	0	15	25
Increase	12	8	8	6	7	33
Maintain previous occupation						
Decline	60	61	83	42	91	42
Constant	23	26	8	5	4	50
Increase	17	13	8	53	4	8

For many people employed in the tourism industry, or who depended on it, there was considerable pressure to change jobs. As described earlier, the tourism industry was severely affected by the tsunami. As the number of tourists declined, tourist-related businesses were adversely affected and many hotels and restaurants closed down or scaled down their operations. This led to job losses. In some cases, workers accepted lower wages in order to maintain their jobs. Those who lost their jobs needed to find new ways to earn a living. But if their skills were industry-specific it was difficult to find new occupations that could even maintain the previous income, let alone provide a higher income. Hence, many people who remained in their previous occupation were compelled to accept a lower income and only a small percentage could maintain their previous income level.

As tourism began to recover, wages improved for those employed in the hotel business. There were shortages in specific skilled labour categories; some of the skilled workers had been killed by the tsunami. Many Labourer households who were employed in the tourism industry and remained in their occupation experienced an increase in income by the time of our survey in mid-2006. But the recovery in tourism was not yet sufficient to restore business for Beach Vendors to previous levels. Over 90 per cent of those who remained in that occupation continued to have a lower income even in mid-2006. There was a similar story in the case of Fishers whose income declined for several reasons. The tsunami destroyed their boats and fishing nets, limiting their capability to fish. In the first few months after the tsunami, fish consumption in Thailand fell because of public fear that the fish were feeding off corpses in the sea. Furthermore, the oil price shock in 2005 raised the price of diesel, a major cost component in the fishing industry. Thus, even when Fishers were given fishing gear, these factors constrained their capacity to fully recover their earlier income levels quickly.

Figure 12 shows the proportion of households in each group that have engaged in borrowing and the proportion of households that did not change their pre-tsunami occupation. Among those who remained in the same occupation, the percentage of families with debts was high, ranging from less than 25 per cent among the Moken people to more than 50 per cent among Beach Vendors, Entrepreneurs, Fishers, and Diversified Households. The Moken families, despite their income reduction, incurred lower debts (possibly because they could not access credit) and experienced serious distress. The other surveyed households, in general, had better access to credit, thus easing the hardship despite their inability to change occupations. Furthermore, many of those who did not change occupations were prepared to remain in their occupations in expectation of the recovery of the tourism and fishery industries. In this case, access to credit enabled them to tide over the expected temporary shortfall in income.

Figure 12: Debt and Unchanged Occupation (%)



To sum up, whether or not they changed occupations, households affected by the tsunami experienced significant income losses. But most people saw the tsunami as a temporary shock and expected the situation would return to more to normal levels after some time. Because of this, many felt that it might be best to maintain the same occupation while waiting for the recovery of the relevant industries. A new occupation can be useful as a temporary job to make ends meet in the short term but it was unlikely to be a better occupation in the long run.¹⁴

This raises the issue of the effectiveness of the occupational training for the tsunami victims which was provided by many agencies. These job training programs may not actually have been of much help. In the first place, people are less likely to look for new occupations if the current bad situation is seen as only as a temporary one. In any case, for people to be attracted to new training programs they need to be able to see a market for the new skills that will provide adequate compensation for the costs of long-term occupational change. Our survey responses indicated that many people were not convinced that the benefits from such training were sufficiently large to compensate for the costs. This may hold a lesson of general relevance for job training programs in disaster situations: If the disaster is seen as only a temporary shock, there may be little incentive for people to undertake substantial training to prepare for alternative long-term occupations.

¹⁴ They are likely to move into the areas where they do not have comparative advantages.

7.4 Impact on Mental Health: Post-Traumatic Stress Disorder, Anxiety, and Depression A group of Thai and international medical researchers associated with the Thailand Post-Tsunami Mental Health Study Group have documented the significant mental health problems that affected many tsunami victims. Their work was based on surveys conducted in February 2005, only a few weeks after the tsunami, and a follow up survey in September 2005 (van Griensven et al., 2006). They found a significant incidence of anxiety, depression, and post-traumatic stress disorder (PTSD) eight weeks after the disaster. Nine months after the disaster, these problems had diminished but had not entirely disappeared.

It is not our intention to examine the issue of mental health in detail in this study. Nevertheless, because information on the mental health problems of our survey respondents might be useful, we included several questions that enabled us to construct an index of mental health. The index was constructed on the following basis: If a person is able to carry on with their normal way of life as if nothing has happened, a score of zero is given. If a person accepts their misfortune, but acts with resolve and copes well with the crisis, a score of one hundred is given. The score is raised to two hundred if they are still in a state of acute sadness, to three hundred if they suffer from hallucinations, and to four hundred if they are paranoid.¹⁵ Hallucination and paranoia are symptoms of post-traumatic disorder. Admittedly, the index constructed in the survey is not comprehensive like the Harvard Trauma Questionnaire and the Hopkins Checklist-25 to detect symptoms of anxiety and depression. Further, respondents may not reveal the true state of mental stress suffered depression and PTSD eighteen months after the tsunami. For a group, a mental stress index computed as an average equal to one hundred indicates that the group has resolved its depression and can cope with the stress in a stable manner. If the index is closer to two hundred, it suggests that the group members are still quite saddened by the traumatic experience. If the group index is higher it indicates that hallucinations and paranoia are common, suggesting acute PTSD.

Table 18 presents the group averages of our mental stress index and some other indicators associated with mental stresses or concerns. The group averages suggest that, on average, people are coping with the effects of the tsunami: They are still affected—“sad”—but are able to accept the tragedy and cope with it. Even the Moken families, who have a higher stress index (144), are not in an acute state of stress or paranoia. However, some individuals within each group do suffer from acute mental problems.

Table 18: Mental Health and Related Factors

	Diversified households (H)	Fishers (H)	Entrepreneurs (E)	Laborers (L)	Beach vendors (B)	Moken (M)
Mental stress index	101	94	100	100	125	144
Received consultation visit	0.69	0.81	0.53	0.61	0.58	0.78
Participated in tsunami drill	0.39	0.58	0.42	0.39	0.53	0.5
Believed that community became more united	0.33	0.36	0.26	0.47	0.33	0.26
Knew someone who attempted suicide	0.21	0.08	0.17	0.11	0.19	0.06
Expected another tsunami	0.56	0.61	0.54	0.43	0.53	0.6
Asset loss (% total)	70.35	67.08	59.58	39.58	51.53	76.94

People who have lost their assets and properties experienced higher mental stress. Moreover, in all groups, anxiety and fear of another tsunami continued to be present among around half of the respondents. In each group some people reported knowing someone who

¹⁵ The score was assigned by enumerators after interviews with respondents.

had attempted suicide, but the proportion was somewhat lower among Fishers and the Moken people. Only around half the respondents reported participating in a tsunami drill; it is not clear if this helped alleviate anxiety and stress.

As mentioned in Section 6.7, mental stress is aggravated further if social tensions have increased within the community due to perceptions of inequitable distribution of assistance. Respondents were asked about community unity after the tsunami, with a score of one if it had strengthened, 0.5 if it was unchanged, and zero if it had deteriorated. If the average group score was below 0.5, it suggests that community cohesion had deteriorated after the tsunami. The group average was less than 0.5 in all cases indicating a widespread view—though the extent of this differed between groups—that community cohesion had deteriorated rather than strengthened after the tsunami.

We used an Ordered Probit regression to explore the relationship between mental health and a number of likely explanatory variables. The index (MENTAL) was constructed as earlier described, and this was regressed on the percentage of total assets destroyed by the tsunami (LOSSASSET), expectations of a future tsunami, interactions with other victims who attempted to commit suicide (SUICIDE), age, the number of family members lost in the disaster (LOSSFAMILY), consultation or visits provided by health officials (CONSULT), and perception of community unity (UNITY).

The results (see equation (2) in the Appendix) suggest that economic loss is a key factor significantly affecting mental health. This finding is consistent with results reported by van Griensven et al. (2006), who found that the loss of livelihood was independently and significantly associated with symptoms of all three mental health outcomes (PTSD, anxiety, and depression). Loss of family members and expectations of future tsunamis, too, adversely affected mental health. On the other hand, a perception that community unity has been strengthened helped reduce mental distress, as did visits or consultations by health officials. Age and knowing someone who had attempted suicide were not significant. These results have obvious policy implications, highlighting the importance of adequate and equitable financial assistance, and the value of visits by health officers to provide counselling and advice.

7.5 The Tsunami and Tourist Attitudes

Given the importance of tourism to the regional economy, we analysed responses obtained in our survey from a small sample (37) of tourists visiting the three provinces to explore their views and attitudes to gain some insights into ways in which the industry could recover rapidly. The sample was evenly distributed between new visitors and previous visitors who had returned to the tsunami-affected beaches. In Table 19 we present results from our survey.

Table 19: Interview with Tourists

	Yes (%)	No (%)
Have you been to Andaman before?	49	51
Do you think that the media has scared visitors away?	57	43
Are you scared of tsunami ghosts?	19	81
Do you think that the next tsunami will hit again within the next few years?	32	68
Do you think that our early warning system can improve safety?	100	0
Do you still recognize any traces of tsunami destruction in this area?	65	35
Do you know anyone who lost their lives here?	22	78

The views expressed by the tourists give grounds to be optimistic about the recovery of the tourism industry. Some two-thirds of the respondents did not expect another tsunami to hit the area within the next few years. In addition, and importantly, they all agreed that the early warning system installed by the government can improve their level of safety. Despite the fact that 22 per cent of the tourists surveyed had known someone who had died in the tsunami, these visitors had, nevertheless, opted to return to the Andaman area. During the first quarter of 2005, unlike Western visitors, Asian visitors reportedly tended to stay away from the affected areas because they felt uneasy about the tsunami ghosts. In our sample, more than eighty per cent of the visitors said that were not afraid of tsunami ghosts and spirits. A slight majority (57 per cent) agreed that the media had scared away the tourists, and two-thirds of visitors still saw some traces of the tsunami's destruction.

The respondents rated the rehabilitation performance of the Thai government in three areas: infrastructure reconstruction, environment restoration, and assistance given to the tsunami victims. The overall rating on a scale of 1 to 5 across all three areas was relatively similar and satisfactory: 3.32 (66 per cent) for infrastructure rehabilitation, 3.38 (68 per cent) for environment restoration, and 3.68 (74 per cent) for victim assistance.

We also asked a hypothetical question to gauge the impact of a tsunami in terms of visitor perceptions of safety ("fear"): How many months would it take the respondents to return to the areas if another tsunami were to strike in the future? If visitors have no fear, we can presume they would return without hesitation when they have the opportunity. But others may be deterred from returning by several factors—if they greatly fear the occurrence of another tsunami, it may take time before this fear subsides; a grim picture painted by the media; a poor reconstruction effort by the government; fear of tsunami spirits and ghosts—all these factors may lead them to go elsewhere. While recognising that the sample included only visitors who had already returned, and hence was biased, we used a multiple regression model to get some indication of the extent to which these factors may influence tourists to delay returning to the region, taking the measure of "fear" as a proxy.

The results suggested that the painting of a grim picture by the media is very likely to have a significant deterrent effect, interacting with the perception of tourists on the rebuilding effort of the government (see the detailed results in equation (3) in the Appendix). The fear of tsunami ghosts, interacting with the number of previous visits, was the most significant variable in the equation, more important than the variables representing expectations of a future tsunami and the positive effects of successful government efforts in rebuilding.

Even if tourists return, a critical issue for the tourism industry is the duration of stay. We ran another regression, using the number of days visitors would stay in the area as the dependent variable, hypothesized to depend on the fear factor, the media scare variable, and an Asian dummy variable, given that Asian visitors tend to have different behavioural characteristics to other visitors. The results (for details, see equation (4) in the Appendix) suggest that fear, as expected, lowers expected duration of stay. Further, any media scare is particularly important as a negative factor in the case of Asian tourists. This finding—if confirmed by more studies of a more representative sample—would indicate that efforts to promote tourism through discount holiday packages and marketing promotions may not work that well for Asian markets. On the other hand, if media coverage is favourable, highlighting the successful rehabilitation of the areas and the tourism industry overall, this may have a more positive impact on Asian tourism.

7.6 Assistance Assessment

7.6.1 Quality, Level, and Effectiveness of Assistance

A major aim of the field survey was to obtain the views of the tsunami victims in each of our categories about the programme of aid and assistance for relief, reconstruction, and recovery. Respondents were asked to evaluate the overall assistance from various organizations on a scale of 1 to 4, with a score of zero when there was no help at all, 1 for a low level of assistance, 2 for medium assistance, 3 for high assistance, and 4 for the highest level of help.

The survey results indicated that respondents in all categories received help and assistance from government, foundations, and private corporations. In many cases, the role of government assistance is complementary to corporations and charity foundations. The government and other organizations sometimes pooled their resources in, for example, providing housing for families whose houses had been destroyed. Similarly, private corporations contributed to financing housing construction done by army units. None of the survey respondents reported any systematic bias in the provision of government assistance.

However, the overall level of satisfaction was not very high (Figure 13). Still, this response must be treated with some caution—it is possible that respondents may have rated the overall assistance not very highly in hopes to get more assistance in the future. Moreover, there was substantial variation among the groups in their assessments of the various donor agencies. While Diversified Households, Entrepreneurs, Labourers, and Beach Vendors ranked assistance from the government equal to or higher than the assistance from the private sector and foundations, Fishers and Moken people rated assistance from foundations and private corporations as superior.

Figure 13: Comparative Evaluation of Donors



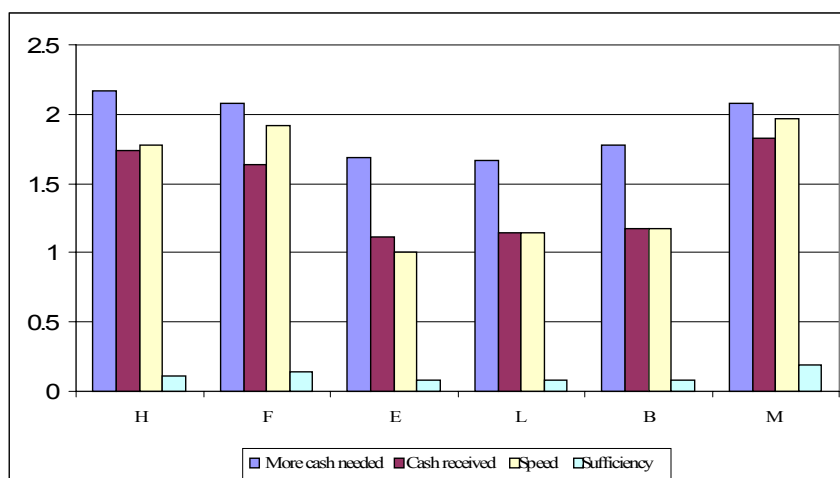
We asked a series of questions about their cash needs, the amount received, the speed and adequacy (Figure 14). Again, the responses have to be treated with caution because respondents are likely to have felt that their answers might affect the amount that they would get in the future, so they may have tended to overestimate their demand for cash aid while underestimating the amount they have received.

Respondents rated the amount of cash grants they had received on the following scale: 0 for no grant, 1 for little, 2 for moderate, 3 for large (high), and 4 for very high. In addition, they were asked to rate their need for future cash grants on the same scale. While there were again differences between the categories, the overall responses indicated that what they had received was low to moderate, and that low to moderate levels of cash assistance were still needed.

As for the speed of cash disbursement, respondents who did not get any cash were assigned a score of zero, 1 if it took more than a month, 2 if two weeks, 3 if within one week, and 4 if they got the cash immediately. Most people got cash aid within a month. The average rating for speed of cash delivery was 1.5, implying that cash aid, on average, was received within about three weeks of the tsunami, but in the case of some groups it was quicker (one to two weeks)—including Fishers and Moken people—but for others, including Beach Vendors and Labourer households, it was closer to a month.

For the question as to whether they received a sufficient amount of cash aid, if the respondent answered no, the score given was zero, and if yes, the score given was one. (Note the difference in the scale for this question when interpreting the height of the column in the Figure). The score for this sufficiency question was very low, ranging from 0.08 (Labourers) to 0.19 (Moken). Again, these scores may have been highly influenced by the perception that responses may influence future assistance levels.

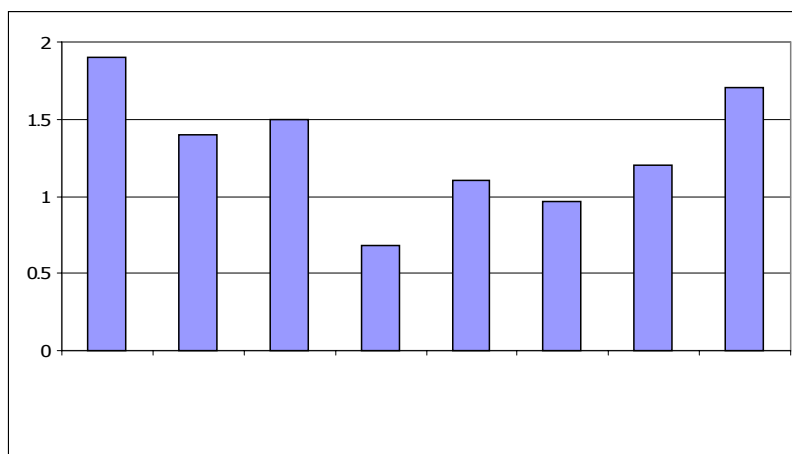
Figure 14: Cash Grants: Sufficiency and Speed



As described earlier, another aspect of assistance was provision of job training. According to the survey responses, job training assistance came relatively late, about seven to twelve months after the tsunami.

In Figure 15 we present the survey responses across groups to questions on areas of need for future assistance. Respondents ranked each category of demand on a scale of zero to four. Leaving aside the question on business assistance, which was only directed to respondents in the Entrepreneur group, the type of assistance that respondents ranked as being most important was cash grants, followed by job training, housing, and health care.¹⁶

¹⁶ The F-tests of means and variances indicate statistical differences at a 0.01 level of significance.

Figure 15: Areas Where Future Assistance is Needed

7.6.2 “Build Back Better”

In all the tsunami-damaged countries, reconstruction activities have been conducted under the slogan “build back better”. The basic idea has been that new construction would not simply replace what existed previously, but would be superior in quality. We investigated community perceptions of the effectiveness of this approach to reconstruction by focusing on a key component of the reconstruction assistance effort: the reconstruction of damaged or destroyed houses. Respondents who had received housing assistance were asked to indicate whether the quality of their newly constructed house was better than their old house.

There have been reports both in Thailand and in other tsunami-affected countries of many instances where communities have not been happy with the new houses. Arguably, people who have been greatly traumatised by the experience of a disaster can react to a new home in different ways. In their mentally depressed state they may view the new house as being an inferior replacement even if it is in fact a superior structure. Alternatively, they may rate it as better because they have lowered their expectations due to reduced circumstances, with unemployment, debt, and so on as pressing factors.

We investigated this using a model with a dummy dependent variable, Build Back Better (BBB), which was assigned the value of one if the new house is perceived as a better house than the old one (0 otherwise). (See the details in equation (5) in the Appendix.) The Probit regression result suggests that the economic circumstances of households may be related to how they view their new houses. Households which have suffered serious economic losses, have experienced a longer period of unemployment, or are in pressing need of more cash assistance (a proxy for being liquidity-constrained) are more likely to rate their new house as better.

Psychological factors (mental distress and loss of family members) rank lower than economic factors. It must be recognised that there is a co-linearity problem between the number of family members lost and mental health deterioration, which may lead to the coefficient of psychological factors becoming statistically non-significant. While our results are not conclusive, it does appear that those who lost almost everything tend to appreciate the value of their new houses, while those who did not lose much appear to have higher expectations of the quality of the houses offered to them. Those who suffered relatively smaller losses tended to deny the notion of build back better.

7.6.3 Role of NGOs

We also obtained some information on community perceptions of the role of NGOs, and, through interviews with seven NGOs, obtained some information from the NGOs' perspectives.

The NGOs were involved in a range of assistance activities. Some of them have provided livelihood equipment and job training, initiated health consciousness campaigns, and set up organic farms and child care centres. They also provided education-related assistance such as providing English teaching, giving student scholarships to tsunami-affected children, and building community libraries.

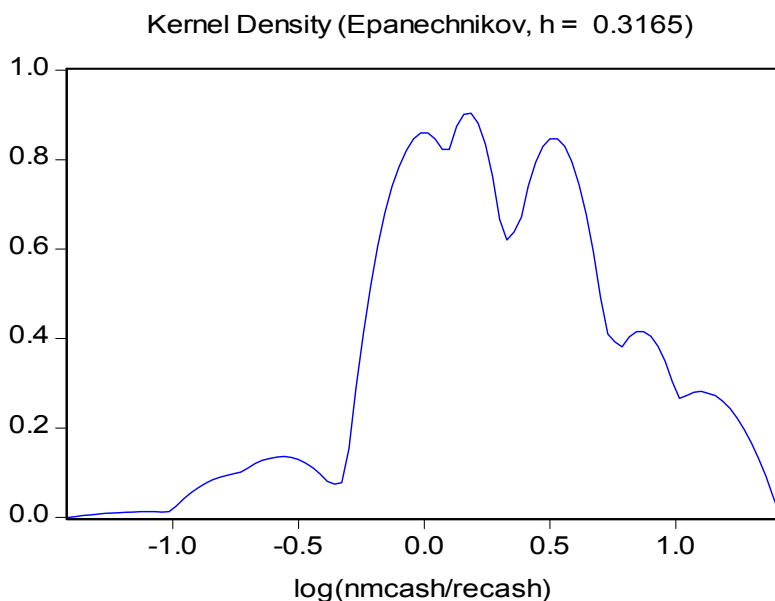
There have been problems. Many of the NGOs interviewed expressed the view that gaining cooperation from villagers can be a problem. There tends to be a perception in the community that the NGOs will only be there in the short-term, and thus cannot be relied on for longer-term assistance.¹⁷ This makes people reluctant to contribute to or participate in their programs. Some NGOs admitted that lack of coordination among them has produced overlap, leading to inequitable and inefficient delivery of assistance. The result has been to produce a sense of unfair treatment among recipients, and the deterioration of social cohesion among villagers. On the other hand, many NGOs encountered avaricious aid recipients who resorted to deception with fake claims of damages and injury—sometimes even using corpses that belonged to other families—to claim compensation and assistance. With assistance focused on material and cash handouts, some children were reportedly disappointed that they were not orphaned because they received less assistance from the NGOs.

7.7 Aid Dependency?

In the literature and debates on aid, a frequently expressed concern is that aid recipients may develop “aid dependency” which creates an attitude that constrains them from taking private initiatives to move beyond aid recipient status. While eighteen months after the disaster may be a relatively short period to assess this, we undertook some preliminary analysis of survey responses to see if any sign of such a syndrome is apparent. Some indications of the development of an “aid dependency” syndrome may be discerned if people continue to rate their assistance needs high even when they have had substantial assistance (and, therefore, should now have lower assistance needs). When we asked the respondents if they still needed additional cash aid in 2007, those who suffered greatly from asset destruction and income reduction were more likely to reply “yes”. But those who have received a new house and a secured land title are unlikely to require more cash, and should need to depend less on financial aid. We explored whether these types of propositions are supported by the survey responses.

An index was constructed to measure the degree of cash dependency by taking the ratio of desired cash in 2007 to the cash aid respondents had received in 2006. If the log value of the ratio of need for cash (nmcash) to the cash received (recash) is negative, households' expressed need for cash aid was considered lower. If the value was positive, the expressed need was considered higher, suggesting a tendency towards growing aid dependency. As seen in Figure 16, the kernel density distribution is tilted to the positive region, indicating that there is evidence supporting the aid dependency view. However, this needs further analysis to examine why the respondents continue to ask for more cash aid.

¹⁷ More than 70 per cent of the NGOs interviewed were not planning to stay in the areas longer than three years.

Figure 16: Distribution of Demand for Aid with Respect to Aid Received

We explored this further by undertaking a multivariate analysis, defining a dependent variable MORECASH as the **difference** between cash “needed” in 2007 and the sufficiency of cash previously received. A Tobit model was used because respondents are likely to overstate their amount of cash aid needed, hoping to receive more cash, and are likely to understate the amount of aid they received. Hence we used a censored model with extreme values, -3 and 3, resulting in three observations left censored and ten observations right censored.

The results (equation (6) in the Appendix) show that those who believed they had received adequate cash (SUF CASH) tend not to express a need for more financial assistance. Also, it is interesting to note that those who have borrowed tend not to seek more money. A possible explanation is that the fact that they have borrowed indicates they have access to credit markets, hence they are not highly credit-constrained and do not seek more handouts from donors. Looking at the variables that are statistically significant and positive, only those who have lost their livelihoods through mental depression and suffered a large income loss after the tsunami appear likely to continue to demand more cash aid.

In sum, after taking into account these factors, we conclude that there is no strong evidence to support the aid-dependency view. The finding that those who are able to adjust through borrowing tend not to ask for continuing handouts suggests that once the difficulties in the immediate aftermath of the disaster are overcome, tsunami victims will not become aid dependent if they have better access to credit markets. In addition, employment-generating programs—which would enhance their capacity to both borrow and repay—are likely to give them a better chance to lead their normal lives without having to depend on aid in the future.

7.8 Other Impacts of Assistance

There are several other aspects related to aid and assistance that we have not explored. We observed, for example, that there were concerns that the cultural heritage of the minority Moken people might be lost due to the outpouring of assistance, which some fear has eroded their traditional way of life. Moken children, some argue, no longer care about their language and culture, and money and material belongings have become the dominant objectives in their lives. They blame this on the fact that their rebuilt community is located

near the road linked to city areas. Donors must be sensitive to such unintended impacts of large-scale assistance and reconstruction activities.

8. CONCLUSION

This study has examined the impact of and the responses to the December 2004 tsunami disaster in Thailand, the worst natural disaster in the world's recorded history, using both official and other publicly available data supplemented by a field survey of affected households, tourists, and NGOs. Two years after the tsunami, while the human dimensions of the tragedy will take much longer to heal, the country has made major steps towards recovering from the worst economic effects of the disaster.

There is a general consensus that the initial relief effort was quite satisfactory, given the unpredicted nature of the disaster and the further complications created by having a very large number of foreign tourists among the victims. The huge international media coverage of the disaster led to an outpouring of offers of assistance from governments and communities around the world. Thailand, however, refused to solicit official financial assistance for the recovery and reconstruction phase, relying on domestic sources and organizations. The domestic community and corporate sector response was very positive, leading some analysts to argue that the decision to rely on domestic finances probably ensured a stronger overall response than would have otherwise have been the case.

The largest economic impact was on the tourism industry, followed by the fisheries sector in the affected southern regions. In contrast to the situation in Indonesia and Sri Lanka, the economic losses were not primarily from damages to physical assets and infrastructure but to losses from foregone earnings from the tourism industry. In the tourism industry itself, the tsunami did not completely destroy all hotels and other facilities even in the affected regions, but large losses came from the sharp falls in tourist arrivals. The immediate impact on the regional economy was severe. But the overall effects of the tsunami on the wider national economy—even in the short term—were muted to some extent by the fact that alternative destinations in the country were able to become substitute destinations for tourists. Overall, initial estimates of the negative impact on the economy were quickly revised. Over the past two years we have also witnessed a general recovery in tourist arrivals, though Asian tourists have been more reluctant to return and the fisheries sector has had most of the necessary boats, equipment, and so on restored.

The relief and subsequent reconstruction efforts were facilitated by the relative proximity of the affected areas to the Bangkok metropolitan region. Relatively easy access to the region meant that emergency assistance could be rushed in quickly. The availability of a large pool of construction labour and materials allowed reconstruction activities to be undertaken without major supply-side constraints. In particular, with a construction sector that had yet to recover fully from depressed demand in the wider economy, the demand generated by large-scale reconstruction did not produce the kinds of cost increases seen elsewhere. In other words, reconstruction efforts were not affected by cost increases associated with Dutch disease effects of a construction boom.

Though the immediate response to the disaster within the first few weeks of the tsunami can be considered a success, poor coordination among aid donors, NGOs, and aid recipients hampered effective delivery, and sometimes led to inequities and waste in aid distribution. Some job training programmes did not lead to employment because they did not provide skills that were in demand in regional labour markets. In any case, the fact that the disaster was seen as a temporary (one-off) shock of which the effects would not last for long meant that most people were not interested in undertaking costly training for a new occupation. The assistance they sought in the short term was primarily financial assistance (cash) and/or

access to credit markets so that they could cope with the immediate problems caused by loss of incomes and livelihoods. In the longer term, they primarily sought assistance to restore their damaged or destroyed assets.

The overall reconstruction effort, despite some of these limitations, is seen by most people as reasonably successful. However, the experience of post-tsunami reconstruction suggests that greater direct cash assistance, improved access to credit markets (including microfinance), and better coordination among assistance agencies could significantly improve the performance of future programmes in dealing with the effects of natural disasters. That kind of assistance can also address possible concerns about the development of aid dependency. Our study showed no evidence that the growth of aid dependency was a problem. Most people who continued to ask for assistance did so because they were genuinely in need of financial assistance because they had lost their livelihoods and were unemployed, with little or no access to credit markets.

Many of the inefficiencies in aid programmes reflected the problems of supply-driven assistance. Beyond the immediate emergency relief stage where food, medicine, clothing and basic shelter were priorities, direct financial assistance would have allowed most households to obtain what they required from the markets. While supply-oriented assistance cannot be avoided during the immediate response phase because donating agencies and corporations are most efficient in utilizing their core competencies, the reconstruction experience has highlighted the need to adopt a more demand-oriented, participatory approach during the period of rehabilitation and reconstruction so that aid can be effectively channelled into areas of greatest need in cooperation with local communities.¹⁸

Broader issues have been raised about the need for greater preparedness to face natural disasters. These include establishment of early warning systems, development of greater community awareness about natural disasters and how to prepare for them, and use of market instruments on the part of the private sector and households to insure against damages from such disasters. Subsidized insurance policies covering catastrophic losses, through providing tax incentives to market participants, can develop disaster insurance markets and induce private firms to get involved. This public subsidy would be less costly than spending on relief programs after disasters strike. Some progress has already been made with early warning systems. However, the relative infrequency of this kind of major disaster may mean that in the absence of any similar disaster in the near future, community recognition of the dangers of such disasters may not be sustained.

Broader lessons and issues have also been raised for the international community. The Thai government did not specifically ask for financial aid from the international community; indeed it encouraged international donors to direct their assistance to other countries, such as Indonesia and Sri Lanka, which suffered more than Thailand and which were less able to generate the financial resources needed for reconstruction. However Thailand did ask for a different form of assistance from developed countries: It requested the lifting of barriers that prevented access to donor markets for Thailand's exports. Thailand argued that the removal of tariff and non-tariff barriers is the best kind of assistance developed countries can give to developing countries hit by disasters. Such market access would give developing countries a chance to achieve sustainable recovery. Regrettably, this request was largely ignored despite the rhetoric of many foreign governments that trade is better than aid as a form of assistance for development.

¹⁸ The pattern of financial assistance provided to tsunami victims has set the standard for mitigating the impact of other natural disasters. Thailand is prone to frequent floods and droughts. In early 2006, the victims of flash floods and mudslides were given \$ 600,000 from a contingent budget earmarked for natural disaster relief.

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APPENDIX

(1) Demand for Credit (CREDIT)

Method: Least Squares, 85 observations
White Heteroskedasticity-Consistent Standard Errors & Covariance

$$\begin{aligned} \text{CREDIT} = & 1.845 & -0.002 & \text{INTEREST} & + & 0.507 & \text{LOG (TOTAL-AID)} & + & 0.507 & \text{BUSINESS-LOAN} \\ & (1.070) & (-1.967)** & & & (3.332)*** & & & (1.750)* \\ & & & & & & & & & \\ & + & 0.771 & \text{COLLATERAL} & + & 0.245 & \text{LOG(YB*UNEMPLOY)} \\ & & (2.996)*** & & & (2.082)*** & & & & \end{aligned}$$

Adjusted R-squared 0.255, F-statistic 6.755, Prob (F-statistic) 0.000

(2) Mental Health Problem (MENTAL)

Method: ML – Ordered Probit (Quadratic hill climbing)
252 Observations
Number of ordered indicator values: 5

$$\begin{aligned} \text{MENTAL} = & 0.366 & \text{EXPTSUNAMI} & + & 0.286 & \text{SUICIDE} & + & 0.016 & \text{LOSSASSET} \\ & (2.122)*** & & & + & (1.550) & & & (4.171)*** \\ & & & & & & & & \\ & - & 0.005 & \text{CONSULT*LOSSASSET} & - & 0.334 & \text{UNITY} & + & 0.281 & \text{LOSSFAMILY} & + & 0.006 & \text{AGE} \\ & (-2.260)*** & & & (-2.083)*** & & (1.857)* & & & & & (1.217) \end{aligned}$$

LR statistic (7 df) 40.0442,
LR index (Pseudo-R2) 0.063
Probability (LR stat) 1.23E-06

(3) Tourist Attitude (FEAR)

Method: Least Squares
37 Observations

$$\begin{aligned} \text{FEAR} = & 5.853 & -4.953 & \text{MEDIASCARE*REBUILDING} & + & 2.460 & \text{EXPTSUNAMI} & + & 16.14 & \text{GHOST*VISIT} \\ & (3.340) & (-2.596)*** & & & (1.040) & & & (7.005)*** \end{aligned}$$

Adjusted R-squared 0.321, F-statistic 6.697, Prob(F-statistic) 0.0011

(4) Stay Length (STAY-LENGTH)

Method: Least Squares
37 Observations
White Heteroskedasticity-Consistent Standard Errors & Covariance

$$\begin{aligned} \text{STAY-LENGTH} = & 18.68 & -0.472 & \text{FEAR} & - & 10.86 & \text{MEDIASCARE*ASIAN} \\ & (5.030) & (-2.209)*** & & & (-3.227)*** \end{aligned}$$

Adjusted R-squared 0.201, S.E. of regression 10.559 F-statistic 5.551, Prob(F-statistic) 0.008

(5) Build Back Better (BBB)

Method: ML – Binary Probit (Quadratic hill climbing)
 Sample: 146, 58 Observations with B=0, 88 Observations with B=1
 QML (Huber/White) standard errors & covariance

$$\begin{aligned}
 \text{BBB} = & 5.998 - 1.253\text{LOG}(\text{LOSSASSET}) + 0.205 \text{NMCASH} - 0.159 \text{LOSSFAMILY} \\
 & (2.638) \quad (-2.359)^{***} \qquad (1.749)^* \qquad (-0.668) \\
 & -3.18\text{E-}06 \text{DEBT} - 0.102 \text{MENTAL} - 0.047 \text{UNEMPLOY} \\
 & (-1.731)^* \qquad (-1.281) \qquad (-2.357)^{***}
 \end{aligned}$$

Z-statistics in parentheses
 LR statistic (6 df) 22.159, McFadden R-squared 0.112,
 Probability(LR stat) 0.0011

(6) Aid Dependency (MORECASH)

Method: ML – Censored Normal (TOBIT) (Quadratic hill climbing)
 252 Observations
 Left censoring (value) series: -3, Right censoring (value) series: 3, 3 Left censored obs 3, 10 Right censored obs, 239 Uncensored obs

$$\begin{aligned}
 (6) \text{ MORECASH} = & 0.346 - 8.05\text{E-}07 \text{DEBT} + 8.52\text{E-}07 \text{UNEMPLOY*YB} + 0.132 \text{MENTAL} - 0.763 \text{UFCASH} \\
 & (3.312) \quad (-2.542)^{***} \qquad (3.172)^{***} \qquad (2.508)^{***} \qquad (-3.380)^{***}
 \end{aligned}$$

Adjusted R-squared 0.120
 S.E. of regression 1.098

***, **, and * significant at the 1, 5, and 10 per cent level, respectively.

Definition of Variables

AGE	Age of respondents
ASIAN	Dummy variable = 1 if Asian visitor, 0 otherwise
BBB	Dummy variable for build back better house, 1 if better, 0 otherwise
BUSINESS-LOAN	Dummy variable for loan purpose, business = 1, 0 other purpose
CONSULT	Dummy variable = 1 if received consultation or visits by health officials, 0 otherwise
COLLATERAL	Dummy variable for loan collateral requirement 1 if required, 0 otherwise
CREDIT	Amount of borrowing
DEBT	Amount of debt incurred after the tsunami
EXPTSUNAMI	Dummy variable = 1, if respondent expects another tsunami within a few years, 0 otherwise
FEAR	A proxy for fear of tsunami (number of months required before returning to the area where the tsunami struck)
GHOST	Dummy variable = 1 if respondent is afraid of tsunami ghosts and spirits, 0 otherwise
INTEREST	Interest rate on loan
LOSS-ASSET	Percentage of destroyed assets
LOSS-FAMILY	Number of family members lost
MEDIASCARE	Dummy Variable = 1 if respondent agreed that media

MENTAL	has scared visitors away, 0 otherwise Index of mental health: normal = 0, resolve=1, sad = 2, hallucination = 3, paranoid = 4
MORECASH	Difference between the need for more cash aid (NMCASH) and the sufficiency of cash aid previously received (SUFCASH)
NMCASH	Liquidity constraint expressed by degree of need for cash
REBUILDING	Dummy variable for visitors' perception of the rebuilding in the area: 1 if there are traces of physical damage, 0 otherwise
SUICIDE	Dummy variable = 1 if knowing other victims who had attempted to commit suicide, 0 otherwise
SUFCASH	Sufficiency of cash aid previously received
STAY-LENGTH	Number of days visitors would prefer to stay
TOTAL-AID	Total amount of financial aid
UNEMPLOY	Number of months being unemployed after the tsunami
UNITY	Variable representing the perception of changes in community unity: 1 if strengthened, 0.5 if unchanged, 0 if deteriorated
VISIT	Number of previous visits in the Andaman area
YB	Pre-tsunami monthly income