



# Economic Impact of Tsunami on Thailand

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# **Economic Impact of Tsunami on Thailand**

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## **1. Introduction**

An earthquake measured 9.0 on the Richter scale took place in the province of Aceh in the island of Sumatra, Indonesia on Sunday, 26<sup>th</sup> December 2004. This seismic shift resulted in Tsunami in the Indian Ocean where giant waves affected coastal cities of Indonesia, Malaysia, Thailand, Myanmar, Bangladesh, India, Maldives and Sri Lanka. It is also reported that coastal areas as far as Africa are also affected, they are Kenya, Somalia and Tanzania. The total death toll is reported at around 165,000 lives, most of whom are poor citizens in Indonesia, Sri Lanka and India. Thailand also suffered a loss of more than 5,000 lives with damages to homes, dwelling, infrastructure, schools, temples and businesses. The Tsunami affected the coastal areas in 6 provinces in the South of Thailand: Phuket, Phangnga, Krabi, Ranong, Trang and Satun. With the damage of such scale it is inevitable that a substantial impact will be felt economically, socially and politically. This Tsunami also affected communities around the world as can be seen in the volume of donation from international community of as much as US\$ 5 billion as of January 2005.

This article aims to summarise information available to date and assess the economic impact of Tsunami on the Thai economy. Given the unfamiliar nature of this natural disaster it is important that one carefully provides a conceptual framework that will help guide discussion and understanding. It is also important to note at the outset that statistics used in this article are not in anyway finalised as they are continuously being updated daily. However, as nearly two months have passed, most of the statistics gathered to date should largely resemble the nature and the magnitude of the incidence.

Following this introduction, is a discussion of the conceptual framework used in this article in analysing the economic impact of Thai Tsunami. Section 3 provides the state of the Southern economy. Section 4 presents the magnitude of physical impact of Tsunami. Section 5 and 6 present the economic loss of Tsunami and the impact of Tsunami on economic growth respectively. A conclusion is given in section 7.

## **2. Conceptual Framework**

On conceptual framework, it has been observed that two approaches have been generally adopted when analysing the economic impact of Tsunami. One is to discuss the financial cost of Tsunami (but often coined as economic costs) and another is to estimate the impact of Tsunami on GDP and economic growth. Rarely, will one adopt a social welfare analysis of the impact of Tsunami on the economy. This article adopts a view that

Tsunami has created a negative shock to the Thai economy where human, physical and environmental capitals have been reduced. A reduction in capital itself will generate an economic loss that need to be measured.

Following the initial reduction in capitals followed subsequent rounds of economic activities that have to be carefully presented in order to avoid interpretation errors. These errors generally arise from double counting the impacts, mistaking distribution effect or transfer effect for economic loss, omitting substitution effects, and most importantly, mistaking an increase in GDP figures for social welfare improvement. Following provides explanations of these conceptual issues.

Often once an initial shock took place, an initial loss can be estimated in terms of loss of capital -- human, physical and environmental losses. For example, a destruction of coastal infrastructure may cost Thailand 100 million baht. Once this valuation is accounted for one need not add another, say, 120 million baht of a newly approved government budget for infrastructure rehabilitation program to the original 100 million baht of the loss of capital. Adding 120 million baht of government budget to the already accounted capital loss of 100 million baht will result in doubling counting and will make the total economic loss way too large.

The issue of distribution impact or transfer impact is similar to that of double counting. For instance, a poor family in Krabi province may lose their home and all their cloths and this misery resulted in influx of donation from all over Thailand to help out the homeless families. These donations or expenses cannot be counted as economic costs of Tsunami as they merely act as transfer of wealth from people all over Thailand to the needy in the affected areas. These transactions are generally termed as distribution effect or transfer effect where wealth changes hands from one person to another. They are not economic losses.

The substitution effect can be easily illustrated by using the case of tourism impact. As Tsunami affected mainly the coastal areas of the 6 provinces in South Thailand, a major impact is represented in terms of losses of hotel and tourism businesses. When hotel rooms became vacant and tourism business along the affected areas is damaged, this estimation is generally used to represent a loss to the tourism industry. An interesting investigation is to observe how tourists substitute their destinations away from hotels along the affected coastal areas to hotels in unaffected areas in Thailand. May be Tsunami led to an increase in hotel business in central city areas of Krabi province where waves did not reach or may be European tourists switch their destinations to Kho Samui instead where Tsunami did not have an impact. An increase in tourist income in other substitution sites is often neglected from the analysis. What needs to be carried out is to observe how the total number of tourists in the whole Thailand has changed after Tsunami took place. Using the total number of tourist for the whole Thailand will net out the possible substitution effect of switching tourist among destinations. Currently, the Tourism Authority of Thailand does not have an update statistics for the total number of tourists for the all the provinces throughout Thailand after Tsunami has taken place. When these statistics are available one will have a clearer understanding of the impact of Tsunami on the tourism industry of Thailand.

Last but not least is the interpretation of changes in GDP resulting from Tsunami, both in baht and also in terms of growth rate. Gross Domestic Products or GDP is a notion that resembles the concept of “income” of a country. Under normal circumstances, when

GDP or income increases one will interpret such a change as an improvement in standard of living of that economy. Particularly so when, under normal circumstances, an increase in income is spent freely on goods and services as it will generate highest welfare. Such an increase in GDP or income will constitute an improvement in social welfare as it raises our standard of living because we have more income as well as the ability to freely spend it on our first best or most preferred choice of consumption bundle. In the case of Tsunami the story is a little different. When sales of construction material increase as damaged homes need rebuilding, GDP or income of the construction sector will also increase. This increase in GDP or income of the construction sector constitutes a re-allocation of resources away from the first best consumption bundle that the Thai economy would have chosen otherwise had Tsunami did not take place. These resources are now re-allocated to the construction sector that was previously unplanned. Switching resources away from its first best alternatives to the construction sector, although constitutes an increase in GDP or income of the construction sector, it cannot in anyway be considered welfare improving. For this reason, it is important that GDP figures that are used when analysing Tsunami are interpreted with great caution. Although it represents an increase in income, these numbers should not be mistaken as an indicator of social welfare improvement.

With this conceptual framework, it is therefore important to surmise that the value of capital loss is the most suitable indicator to represent the magnitude of economic loss resulting from Tsunami. Other statistics such as government relieve budget, flows of donation, international assistance, changes of tourism income in the affected areas or changes of GDP merely portray the magnitude of the different types of events that took place after the incidence.

### **3. State of Southern Economy**

Before addressing the issue of economic impact of Thai Tsunami a brief description of the economy of the 6 provinces in the Southern region of Thailand is essential. The 6 provinces in the Southern region of Thailand are Phuket, Phangnga, Krabi, Ranong, Trang and Satun. Table 1 shows that the total population of the affected provinces is about 2 million and accounts for only 3 per cent of the total population of Thailand (62 million). The Gross Provincial Product (GPP) of the 6 provinces accounts for only 2.9 per cent of the total GDP of Thailand. Provinces with highest income is Phuket, followed by Trang, Krabi, Phangnga, Satun and Ranong. The average per capita income in 2002 is about 95,724 baht per person per year that is higher than the Thai average of 85,951 baht per person per year. Phuket has the highest per capita income of 231,186 baht per person per year while Trang has the lowest per capital income of 49,870 baht per person per year.

In general, agriculture accounts for about 25 per cent of total output of the 6 provinces followed by hotels and restaurants, wholesale and retail trade, and fishing. The affected 6 provinces in the Southern region of Thailand are the world renowned tourist destinations particularly Phuket, Krabi and Phangnga provinces. During 1999-2003 these provinces attracted more than 9 million foreign tourists per year.

**Table 1 State of Economy in Six Southern Provinces**

<b>Item</b>	<b>Phuket</b>	<b>Phangnga</b>	<b>Krabi</b>	<b>Ranong</b>	<b>Trang</b>	<b>Satun</b>	<b>Thailand</b>
Area (sq.km.)	543	4,171	4,709	3,298	4,941	2,479	513,115
Share of area (%)	0.11	0.81	0.92	0.64	0.96	0.48	100.00
Population (2002)	270,438	239,401	377,954	163,160	603,072	270,802	62,799,872
Share of population (%)	0.43	0.38	0.60	0.26	0.96	0.43	100.00
Average GPP per capita (2002) (baht)	231,186	65,590	71,158	75,758	49,870	64,530	85,951
Density per sq.km.	498	57	80	49	123	109	122
<b>GPP by sectors (million baht)</b>							
<b>Agriculture</b>	2,494	5,768	8,435	2,916	9,296	4,739	330,383
Share of agriculture (%)	0.75	1.75	2.55	0.88	2.81	1.43	100.00
Agriculture, hunting and forestry	832	4,086	7,760	1,252	7,570	2,317	279,992
Fishing	1,662	1,681	675	1,664	1,726	2,422	50,391
<b>Non-agriculture</b>	22,778	4,408	6,996	3,377	10,398	4,851	2,908,647
Share of non-agriculture (%)	0.78	0.15	0.24	0.12	0.36	0.17	100.00
Mining and quarrying	35	95	110	42	85	66	71,682
Manufacturing	899	440	902	426	2,456	1,344	1,186,998
Electricity, gas and water supply	928	212	279	202	482	169	110,145
Construction	760	133	314	122	357	249	80,631
Wholesale and retail trade, repair of motor vehicles and motorcycles							
Personal and household goods	2,159	1,025	1,255	868	2,598	1,150	476,851
Hotels and restaurants	11,183	346	1,422	78	126	56	124,182
Transport, storage and communications	3,773	473	713	413	973	369	330,220
Financial intermediation	579	175	222	124	358	99	93,327
Real estate, renting and business activities	656	360	518	290	808	340	129,359
Public administration and defence, compulsory social security	393	348	338	249	566	283	106,666
Education	412	354	483	208	870	378	87,019
Health and social work	315	231	170	133	417	139	44,573
Other community, social and personal services activities	658	215	261	220	293	206	63,544
Private households with employed persons	28	2	9	3	9	2	3,450

Source: Bank of Thailand 2004.

Furthermore these provinces also enjoy an increase in tourism growth rate of 8 per cent annually. About 85 per cent of tourists are attracted to the well known destinations in Phuket, Krabi and Phangnga provinces. European tourists account for as much as 60 per cent of all international tourists in these areas. Although the 6 provinces account for only 2.9 per cent of GDP of Thailand, they are able to generate as much as 100,000 million baht of tourism income or as much as 17.4 per cent of the total tourist income of Thailand.

Agriculture plays an important role for the economy of the 6 provinces. As much as 69 per cent of income is derived from rubber plantation, palm oil and coffee. The remaining 31 per cent is from fishery. With an exception of Krabi, fishery industries of these provinces generate substantial income to the local population. The fishery activities commonly found are boat piers, fish trading centers, fishery transportation as well as fishery processing.

Given the economic background of these 6 provinces it is inevitable that the Tsunami impact will be felt mostly by the tourism industry and the fishery industry as their locations are sensitive to coastal conditions.

#### **4. Physical Damages from Thai Tsunami**

The physical impact of Thai Tsunami took place in many forms ranging from loss of lives, loss of parents and children, loss of love ones, homelessness, destruction to physical infrastructures and destruction to natural resources. A brief accounting of these physical damages will provide an important link to the loss of capital and hence economic losses.

In Table 2, the death toll of the victims of the Thai Tsunami totaled 5,395 as of 10<sup>th</sup> January 2005. As the affected areas are predominantly tourist destinations, as much as half of the victims (1,953 person) are foreigners such as Swiss, Dutch and German while another half (1,900 persons) are local Thai. To date, as much as 1,542 persons are still reported unclassified. This leaves a tremendous effort to be devoted to identification and verification work that will still continue in the months ahead. Currently, collaborative work has been established between local Thai staff and those from international community in terms of identification and verification of unidentified bodies.

The loss of lives has created a devastating impact emotionally to their friends and relatives. But most importantly, some of those who lost their lives left behind their children who will remember this Tsunami as an incidence that took away their mother or father, or both. Table 2 and Table 3 show that as many as 882 orphans have either lost their father, mother or both. This psychological impact cannot generally be measured in monetary terms but it is deeply felt by all. To date, there are still as many as 2,993 reported of loss of persons. Some of them may be among the unidentified bodies (1,542 victims) while the remaining may still be missing.

**Table 2 Victims of Thai Tsunami**

	Phuket	Phangnga	Krabi	Ranong	Trang	Satun	Total
<b>Death</b>							
Thai	151	1,227	357	156	3	6	1,900
Foreigners	111	1,633	203	4	2	-	1,953
Unidentified	17	1,364	161	-	-	-	1,542
<b>Total</b>	<b>279</b>	<b>4,224</b>	<b>721</b>	<b>160</b>	<b>5</b>	<b>6</b>	<b>5,395</b>
<b>Injury</b>							
Thai	591	4,344	808	215	92	15	6,065
Foreigners	520	1,253	568	31	20	0	2,392
Unidentified	-	-	-	-	-	-	-
<b>Total</b>	<b>1,111</b>	<b>5,597</b>	<b>1,376</b>	<b>246</b>	<b>112</b>	<b>15</b>	<b>8,457</b>
<b>Loss</b>							
Thai	256	1,439	329	9	1	-	2,034
Foreigners	382	321	256	-	-	-	959
Unidentified	-	-	-	-	-	-	-
<b>Total</b>	<b>638</b>	<b>1,760</b>	<b>585</b>	<b>9</b>	<b>1</b>	<b>-</b>	<b>2,993</b>
<b>No. of orphans (persons)</b>	<b>167</b>	<b>478</b>	<b>134</b>	<b>67</b>	<b>23</b>	<b>13</b>	<b>882</b>

Source: Department of Disaster Prevention and Mitigation, Ministry of Interior, <http://www.disaster.go.th>, as of 10<sup>th</sup> January, 2005.

**Table 3 Loss of Parents and Guardians**

Province	Family	Loss of Father		Loss of Mother		Loss of both parents		Loss of Guardian		Grand Total		
		Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Total
Phangnga	116	29	44	40	38	2	2	6	6	77	90	167
Krabi	380	79	80	115	133	33	32	2	4	229	249	478
Phuket	81	42	42	20	25	1	4	-	-	63	71	134
Ranong	44	16	16	14	5	2	10	1	3	33	34	67
Trang	16	8	7	5	2	-	-	1	-	14	9	23
Satun	10	2	2	1	-	3	1	1	3	7	6	13
<b>Total</b>	<b>642</b>	<b>176</b>	<b>191</b>	<b>195</b>	<b>203</b>	<b>41</b>	<b>49</b>	<b>11</b>	<b>16</b>	<b>423</b>	<b>459</b>	<b>882</b>
		367		398		90		27		882		

Source: Department of Disaster Prevention and Mitigation, <http://www.disaster.go.th>, as of 10<sup>th</sup> January, 2005.

The number of injury from the incidence totaled 8,457 persons. As many as 6,065 of these injured persons are local Thai with about 2,392 foreigners. These people needed to be transported out of the affected areas to the nearby hospitals where immediate medical treatment was involved. Flows of doctors, medical supplies, rescue teams, blood, food supplies and many other necessities from throughout Thailand and international community was evidenced. Most importantly, a large number of volunteers who left what they were doing at home and went to the affected areas just to extend a helping hand reflected the level of Thai social capital that remained intact while much economic losses occurred. Volunteer efforts are seen in activities such as searching and collecting bodies, cooking and handing out food, help locate lost of relatives and friends or mere keeping company. A female European survivor told a story that while all her belongings were washed out by the waves and she had nothing left, a Thai girl came to assist her. Before they left each other this Thai girl put 500 baht in her hand and said “just in case you need to buy anything while returning to Europe”. Then they said goodbye to each other.

Next to the loss of lives and parents, Tsunami has taken away homes of many poor families. Table 4 shows that Phangnga, Krabi and Phuket suffer the greatest loss in terms of damages to homes. A total of 58,550 homes have been lost and another 6,824 homes are damaged. Table 5 also shows the impact of Tsunami on schools. Had Tsunami taken place during school hours it is likely that many more children will be affected. Although the damages to homes and schools of the local families may entail small economic loss but this impact was very disturbing to the rest of Thailand. Only a matter of hours after the incidence, donations in terms of food supplies, clothing and utensils are made to these families, not only from within Thailand but donations are seen from all over the world.

Besides losses of homes and schools that tend to have sentimental impact to the survivors the other physical capital that were affected by the Tsunami are fishery capitals, crop, livestock, infrastructure and enterprises. The detail of these impacts can be found in the Appendix 1 to Appendix 5. Tsunami damaged many aquacultural farms, fishing boats and fishing gear along the coastal areas of the affected provinces. A total of 5,977 fishing cages were destroyed, and about 5,800 fishing boats were damaged. The total economic loss in the fishery sector totaled 1,757 million baht. In addition, another 900 touring boats are also reported damaged. (Appendix 1) Livestock that were affected are cattle, goat, sheep, poultry and swine with a total economic loss of 17 million baht. (Appendix 2) Losses to crops are also reported throughout the 6 provinces but Phangnga was severely affected as 6,640 rais of fruit trees were destroyed valued at 2,458 million baht. The total loss amounts to 262 rais of rice paddy, 2,201 rais of field crop, and 6,710 rais of fruit trees. The total economic loss in terms of crop damage totaled 8,353 million baht. (Appendix 3)

Private enterprises along the coastal areas have been badly affected. These enterprises comprise primarily of tourist related business such as hotels, restaurants, shops and small stools selling miscellaneous items. Appendix 4 shows that Tsunami affected a total of 324 hotels, 345 restaurants and 364 shops and as many as 4,306 small stools selling miscellaneous items. The total value of destruction to private enterprises totaled 12,852 million baht.

**Table 4 Damage to Homes and Homeless Victims**

No.	Province	Homeless Victim		Damage to Home		Total (unit)
		Person	Family	whole	partial	
1	Phangnga	19,509	4,394	2,563	2052	4,615
2	Krabi	15,812	2,759	396	262	658
3	Phuket	13,065	2,613	366	550	916
4	Ranong	5,942	1,509	255	111	366
5	Trang	1,302	1,123	33	154	187
6	Satun	2,920	82	2	80	82
Total		58,550	12,480	3,615	3,209	6,824

Source: Department of Disaster Prevention and Mitigation, <http://www.disaster.go.th>, as of 10<sup>th</sup> January, 2005.

**Table 5 Damage of Schools**

(unit: number of school)

No.	Province	Total damage	Substantial damage	Minimal damage	Total
1	Krabi	1	0	9	10
2	Phangnga	3	1	0	4
3	Phuket	0	4	2	6
4	Ranong	1	2	1	4
5	Satun	0	0	0	0
6	Trang	0	0	0	0
Total		5	7	12	24

Source: Department of Disaster Prevention and Mitigation, <http://www.disaster.go.th>, as of 10<sup>th</sup> January, 2005.

Tsunami also damaged the infrastructure along the coastal areas of the 6 provinces. It has been reported that waves have damaged 83 harbours, 17 bridges, 11 wooden bridges, 77 roads, 1 dike, 6 dams. 32 electricity lines, 15 pipewater systems. These damages to physical capital totaled 1,028 million baht.

Lastly, the impact of Tsunami on natural resources and environment has received much attention from academics, the Government and town administrators. The original concern relates to the possible impact that Tsunami waves may have on corals and seagrass along the coastal areas of the 6 provinces. Corals and seagrass are considered valuable to the Southern ecology as they serve many ecological functions. To tourists, these corals are prime attractions to scuba divers and snorkelers. Much of the tourism industry in the Southern region of Thailand and the revenue derived from it is largely attributed to this natural asset. After two months have passed it is learned that this natural disaster has made only minimal impact to the natural environment. Table 6 shows that Tsunami waves have had minimal impact on coral, mangrove forests and forests. The only environmental impact can be seen in the case of increase soil salinity as seawater flooded a large land area. Another substantial impact is seen in terms of beach debris. However, the impact on beaches involved merely clean up activities leaving much of the environmental asset intact. After two months have passed, many have made observations that may be Tsunami waves have clean up many unwanted cum man-made construction along the beaches and coastal areas of the 6 provinces hence returning the environment back to its original conditions. As Tsunami in itself is a natural phenomenon and its impact on natural resources and environment is both positive and negative, this article will make no attempt to monetise its effects.

**Table 6 Damage of Natural Resources**

Province	Coral	Beach	Mangrove Forest	Forest	Water Utilization	Waste Disposal/ Waste Water Treatment	Saline Soil Area
Phangnga	Substantial damage 625 rais	Substantial damage 5,000 rais	Minimal damage 1,900 rais	Minimal damage 3,500 rais	Under investigation	Under investigation	3,500 rais
Krabi	Minimal damage (about 3,125 rais)	Substantial damage (17 km.) Minimal damage (12 km.)	No damage	No damage	Substantial damage Surface water pond 126 units Ground water pond 50 units	No damage	Minimal damage about 23.5 rais
Phuket	Damage 5-20%	Minimal damage	Minimal damage 10 rais	Damage beach	Surface water sources 32 units Ground water pond 99 units Pipe water 50 systems	Damage municipal waste water treatment	Damage 22 rais
Ranong	Minimal damage about 21 rais	Minimal damage	Substantial damage about 555 rais	No damage	Substantial damage about 6 rais	Minimal damage about 2 rais	Substantial damage about 412 rais
Trang	Minimal damage	No damage	Minimal damage about 20 rais	No damage	Surface water pond 10 units	No damage	No damage
Satun	Substantial damage about 550 rais	Substantial damage about 1,200 rais	Minimal damage about 10 rais	No damage	Substantial damage Surface water source 90 units	No damage	No damage
Total	Minimal damage about 3,146 rais Substantial damage about 1,175 rais	Substantial damage about 6,200 rais	Minimal damage about 1,860 rais Substantial damage about 555 rais	Damage beach about 4,000 rais	Surface water pond 136 units Ground water pond 149 units Surface water source 122 units Pipe water 50 systems	Waste water treatment 2 sites	Saline soil area about 3,957.5 rais

Note: 1 rai = 0.4 acre

Source: Department of Disaster Prevention and Mitigation, <http://www.disaster.go.th>, as of 10<sup>th</sup> January, 2005.

## **5. Economic Loss from Thai Tsunami**

Resulting from the loss of human and physical capital mentioned above, this reduction of capital would lead to a reduction of social welfare. While some of the impact remain sentimental and cannot be monetised others will have market values and hence will allow for aggregation. Monetising the economic losses of Thai Tsunami is useful for many reasons. One may use the economic loss to justify for Government relieve fund or compensation. Or this economic value of the damages may also be used to justify for investment in Tsunami warning system.

In assessing the economic losses of Tsunami this article makes three assumptions. First, the loss of profits resulting from losses of physical capital is already captured in the value of capital itself. For instance, if the value of a hotel reflects its future profits then once this value is captured then there is no need to measure the foregone profits from this hotel. Second, although losses of business will result in unemployment and hence income, this article assumes that the state of economy will return to its full employment therefore any income losses resulting from unemployed factors will be temporary and will not be measured in this study. Third, this article will measure loss of lives in terms of losses of future income only. The economic losses of lives in terms of sentimental values will not be measured here.

Table 7 is an attempt to measure the loss of income from the loss of lives of the local Thai. The number of lost persons consists of death victims and people reported lost. Base on the average income of the people in these provinces (GPP), the total income loss from death victims and lost persons totaled 12,222 million baht. Lost of lives of foreigners are not measured here as their lost of income will appear in the balance sheet of their home countries. Also presented in Table 7 is the cost of providing medical treatment to the injured persons. In this case a total number of both Thai and foreigners are used to calculate the economic loss. With an average treatment cost of around 8,457 baht per person, this brings the total economic loss in terms of medical treatment to 11.74 million baht. Therefore the total economic loss of human capital totaled 12,224 million baht. It is also important to mention here again that these losses only provide the lower bound estimation as sentimental value of lost of lives are not measured here.

Table 8 summarises the total economic losses of Tsunami that is based on the total value of losses of capital, both physical and human. Just as the previous section has quantified the physical impact, this section provides the economic value of these capital losses. The economic losses of physical capital are reported for the agricultural sector (crops), fishery, livestock, enterprises, infrastructure and homes (both whole and partial). The major economic loss is seen in enterprises as it consists of destruction to hotel businesses with the value of 12,012 million baht followed by shops of 191 million baht. Adding the value of loss of lives measured in terms of income loss and cost of injury to the physical loss brings the total value of economic loss of Thai Tsunami to a grand total of 28,435 million baht. (See Table 8)

**Table 7 Income cost from Loss of Lives**

	<b>Phuket</b>	<b>Pangnga</b>	<b>Krabi</b>	<b>Raong</b>	<b>Trang</b>	<b>Satun</b>	<b>TOTAL</b>
<b>1. Death and loss</b>							
Death (persons)	151	1,250	357	156	3	6	1900
Loss (persons)	256	1,430	329	9	1	-	2,034
Death + loss (persons)	407	2,680	686	165	4	6	3,934
GPP 2002 (2004 price) (baht)	241,751	68,587	74,410	79,220	52,149	67,479	
Total income loss (million baht)	3,466.38	6,475.78	1,798.32	460.50	7.37	14.26	12,222.60
<b>2. Injury</b>							
Injury (Thai) (persons)	591	4,344	808	215	92	15	6,065
Injury (Foreigner) (persons)	520	1,253	568	31	20	-	2,392
Total (persons)	1,111	5,597	1,376	246	112	15	8,457
Total cost of injury (million baht)	1,542,401	7,770,315	1,910,300	341,521	155,489	20,824	11.74
<b>Total loss of human capital (1+2) (million baht)</b>	<b>3,467.92</b>	<b>6,483.55</b>	<b>1,800.23</b>	<b>460.84</b>	<b>7.50</b>	<b>14.28</b>	<b>12,234.34</b>

Assumptions: - Average age of dead people (Thai) who affected by Tsunami is about 35 years old.

- Average costs of injury is about 1,388.30 baht per person (Source: National Statistical Office, Thailand)

Note: - Average age of Thai people is about 23-70 years old (2000-2005).

Source: Calculated by TDRI.

**Table 8 Value Capital Loss**

<b>Capital loss</b>	<b>Million baht</b>
Agriculture	8.5
Fishery	1,757.5
Livestock	17.6
Enterprises	12,852.6
Infrastructure	1,060.7
Damaged house (whole)	361.5
Damaged house (partial)	160.5
Income loss	12,222.6
Cost of Injury	11.74
<b>Total</b>	<b>28,453.24</b>

*Source:* Department of Disaster Prevention and Mitigation, Ministry of Interior, <http://www.disaster.go.th>, as of 10<sup>th</sup> January, 2005.

Following the incidence, the Thai Government designated respective Government agencies to respond to the matter. Appendix 6 to Appendix 12 provides details of types of Government relieve funds and the agencies concerned. These spending are summarised in Table 9. The relieve budget from the Office of the Prime Minister generally went to compensate for lost lives, injured person and unemployed person. The total spending as of March 2005 is 99 million baht. The Ministry of Social Development and Human Security also made compensation to the families that were affected in the form of education scholarship to children. Their total spending to date is 7 million baht. Compensation from the Department of Fishery is most significant. The Department of Fishery paid compensation to the farmers for losses of fishing boats, aquacultural farms, fishing gear and others. Their total spending of the Department of Fisheries totaled 272 million baht. The Department of Local Administration Promotion provided compensation to the Tsunami victims for loss of their business. The total spending of the Department of Local Administration Promotion totaled 83 million baht. The Ministry of Finance helped in terms of funeral costs, funeral transportation costs, lost of leader of family, injury and lost of work related appliances. The total assistance of the Ministry of Finance totaled 77 million baht. The Ministry of Labour assisted in terms of employment projects, job placement, job relocation, new occupation and occupation training. The spending of the Ministry of Labour totaled 171 million baht. Lastly, the Ministry of Education was assigned to assist the orphans and Tsunami victims. The spending on orphans totaled 11 million baht and another 76 million baht for the affected families. All these Government spending add up to a grand total of 913 million baht that has been allocated as of March 2005. This total spending is considered small compared to the total damage of 28,453 million baht. This actual spending of 913 million baht is considered much even smaller when compared to the intended Government budget of 70,000 million baht that has been approved for Tsunami relieve fund.

**Table 9 Government Relieve Budget**

Unit: Baht

Financial Aid	Organisation	Phuket	Phangnga	Krabi	Ranong	Trang	Satun	Total
For victims on Tsunami	Office of the Prime Minister	19,411,000	39,833,000	33,252,000	3,452,000	1,413,000	2,233,000	99,594,000
For victims on Tsunami	Ministry of Social Development and Human Security	1,250,000	1,104,800	2,104,500	2,283,000	330,000	56,000	7,128,300
For Fishermen	Department of Fisheries	34,213,820	100,719,070	48,089,405	30,586,434	23,998,983	34,487,869	272,095,581
For SMEs	Department of Local Administration Promotion	51,440,000	12,760,000	7,820,000	830,000	1,100,000	–	83,950,000
For victims on Tsunami	Ministry of Finance	42,083,100	116,218,375	20,151,300	21,705,701	1,960,345	748,930	202,867,751
For unemployment	Ministry of Labour	58,262,840	59,571,558	37,415,060	8,939,884	3,659,544	3,404,374	171,253,260
For school students	Ministry of Education	5,932,000	6,004,000	6,856,000	19,021,000	18,024,000	20,597,000	76,434,000
Total		212,592,760	336,210,803	165,688,265	86,818,019	50,485,872	61,527,173	913,322,892

Source: Department of Disaster Prevention and Mitigation, <http://www.disaster.go.th>, as of 10<sup>th</sup> January, 2005.

## 6. Impact of Tsunami on Economic Growth

The impact of Tsunami has created a first round effect in terms of reduction of capitals as described above. Following the initial impact are subsequent activities such as changes of the flow of tourists, decline of fishery income, increase in government spending to compensate for the losses and so on. These subsequent activities will have an impact on the Thai economy either in terms of reducing income as well as increasing income resulting from increase government spending. To account for these changes of income and economic growth for 2005 the Bank of Thailand has provided a brief analysis of the impact of Tsunami on GDP. The following provides a summary of the analysis of the Bank of Thailand of the impact of Tsunami on GDP.

The Bank of Thailand shows that number of tourist in the 6 provinces accounted for 25 per cent of the total number of tourists in Thailand and tourism in these 6 provinces accounts for 1.3 per cent of GDP at current price. After interviewing local entrepreneurs the Bank of Thailand reports that reconstruction effort will take about 1-2 years and the reduction of income will be mostly felt during the first quarter of 2005 before returning to near normal conditions thereafter. It has therefore been estimated that the reduction of tourism income will measure at 40,000 million baht or about 0.6 per cent of GDP. (See Table 10)

**Table 10 Estimated tourism impact of Tsunami in 2005**

New estimated number of tourists will be decreased about 1.2 million tourists compared to old estimated number of tourists.					
Number of tourists (million tourists)	Q1	Q2	Q3	Q4	2005
Old estimated number					
- whole kingdom	3.2	2.8	3.1	3.4	12.5
- only 6 southern province affected by Tsunami	0.9	0.7	0.8	0.9	3.3
New estimated number					
- whole kingdom	2.6	2.5	2.8	3.3	11.2
- only 6 southern province affected by Tsunami	0.3	0.5	0.5	0.8	2.1
The decreased number of tourists	0.6	0.2	0.3	0.1	1.2
Revenue from tourism will be decreased about \$US1 billion compared to old estimated revenue.					
Revenue from tourism (\$US 1 billion)	Q1	Q2	Q3	Q4	2005
Old estimated number	2.8	2.4	2.3	2.7	10.2
New estimated number	2.3	2.2	2.4	2.6	9.2
The decreased revenue	0.5	0.2	0.2	0.1	1.0

Source: Estimated by Bank of Thailand 2005.

As for the fishery sector which took a severe hit from Tsunami the estimate of the impact on GDP is minimal as the fishery sector accounts for only 17 per cent of the national output or about 0.3 per cent of GDP at current price. It is estimated that with a loss of physical capital in the fishery sector of around 2,000 million baht this will reduce income of the fishery sector by 3,000 million baht.

The loss of tourism income of 40,000 million baht together with the loss of fishery income of 3,000 million baht will have an impact of reducing the Thai GDP growth rate by 0.8 per cent when compared to situation without Tsunami. However, the Bank of Thailand simulation shows that with an inflow of donations of 1,000 million baht and an increase in Government spending of 3,000 million baht that is forthcoming during 2005 these two impacts will help raise income during 2005. Furthermore, the Bank of Thailand will also extend soft loan to the victims of Tsunami by 64.5 million baht (or 0.8 of total credit) which will help increase GDP growth rate by 0.1 per cent. It is worth noting that while the Thai Government announced a total budget of 70,000 million baht to be allocated to the 6 provinces, the Bank of Thailand expects only 3,000 baht will be injected during 2005. However, as of 10<sup>th</sup> January 2005 Table 9 shows that only 913 million baht or about 1.3 per cent of the 70,000 million has been injected thus far.

In all, the Bank of Thailand summarised that the second round of impact will eventually reduce GDP growth rate for 2005 by 0.5 per cent compared to situation without Tsunami. This number needs to be interpreted with caution as the National Economic and Social Development Board (NESDB) also made similar economic simulation after Tsunami took place. Based on the economic model of NESDB they reported that Tsunami will create two effects -- while reduction of tourist income and lost of jobs will reduce GDP growth rate, the increase aggregate demand is expected from the construction and machinery sector and consumption. Opposite from the simulation of the Bank of Thailand that shows a decline of GDP growth rate of 0.5 per cent, the NESDB estimates that Tsunami will produce a net increase in GDP growth rate by 0.15 per cent.

As stated earlier in this article that one needs to interpret the impact of changes of the number of tourist with caution as substitution effect between tourist destinations needs to be accounted for. Further more, although an increase in government spending and flows of donation may boost GDP but these increases in income should not be mistaken for social welfare improvement.

A useful macroeconomic analysis of the Tsunami is made by the Asian Development Bank (ADB). ADB makes a useful comparison between the Tsunami incidence, the SARS outbreak that took place in 2003, the September 11, and the financial crisis of 1997. While all these incidences created negative shocks to the host economy in terms of losses of physical and human capital they each have different impact on GDP. The Tsunami is a one-time event that took place in some specific areas and its impact is very much “once-and-for-all”—something that will probably not happen again for many years ahead. The impact of other shocks such as SARS, September 11 or financial crisis tended to create, on the other hand, future uncertainty, negative expectations and loss of confidence. These negative expectations will have longer term impact on the economy and hence GDP growth rates. ADB stresses that policy implication of Tsunami should focus on area specific

rehabilitation programs that are targeted specifically at the affected victims as its macroeconomic impact tends to be trivial.

## **7. Conclusion**

This article describes the impact of Tsunami on the Thai economy. Most of the impact occurred in the form of losses of lives as well as the welfare of many orphans who lost their parents during the incidence. While the total of more than 160,000 lives are lost from coastal areas around the Indian Ocean, the total number of death in Thailand totaled 5,395 with 882 orphans who lost their parents. The loss of physical capital is seen in the form of losses of business and shops, hotel, fishing boats and fishing gear, aquaculture and infrastructure. These loss of physical capital together with loss of income resulted from loss of lives and medical treatment expenses all added up to around 28,453 million baht. Of this amount, the Thai Government has approved a budget of 70,000 million baht to help towards rehabilitation programs. However, as of January 2005 only 913 million baht has been spent by respective government agencies.

Macroeconomic simulations show mix result. While the NESDB believes that Tsunami will raise GDP growth rate by 0.15 per cent, the simulation by the Bank of Thailand shows that Thai GDP will fall by 0.5 with Tsunami compared to without. This article believes that Tsunami will have small macroeconomic impact as the incidence did not affect the level of confidence or created negative expectations as was the case of SARS that took place in 2003. For this reason, government rehabilitation programs should be area specific and are directed towards the welfare of the remaining victims and the orphans who lost their parents.

## **Appendices**



## Appendix 1 Damage to Fisheries

No.	Province	Damages (surveyed data)										
		Aqua cultures			Number of fishing boats		Fishing gears			Total	Number of touring boats	
		Cage	Pond	Barn	Small	Big	Lamp shade	Ring net	Rattan fish trap		Small	Big
1	Phangnga	1,733	7	67	1,572	333	-	477	514	915,734,111	33	18
2	Krabi	890	2	-	1,034	10	345	643	402	191,696,510	476	-
3	Phuket	529	2	209	968	473	-	649	72	344,911,169	262	87
4	Ranong	1,229	-	-	420	356	56	522	267	170,737,983	-	-
5	Trang	470	-	-	661	1	8	600	483	14,980,000	8	40
6	Satun	1,126	-	1	1	30	274	580	584	119,393,730	-	3
Total		5,977	11	277	4,656	1,203	683	3,471	2,322	1,757,453,503	776	148

Source: Department of Disaster Prevention and Mitigation, <http://www.disaster.go.th> (10/03/2005).

## Appendix 2 Damage to Livestock

Quantity: number of head  
Value: baht

No.	Province	Cattle		Goat and Sheep		Poultry		Swine		Total
		Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Value
		232	4,640,000	211	1,055,000	4,213	189,585	1,944	7,776,000	13,660,585
2	Krabi	7	95,000	107	214,000	208	16,240	-	-	325,240
3	Phuket	-	-	20	20,850	816	80,700	86	202,100	303,650
4	Ranong	166	2,490,000	416	499,200	2,380	59,938	-	-	3,049,138
5	Trang	-	-	36	-	47	-	-	-	43,392
6	Satun	13	195,000	35	42,000	220	6,600	-	-	243,600
Total		418	7,420,000	825	1,831,050	7,884	353,063	2,030	7,978,100	17,625,605

Source: Department of Disaster Prevention and Mitigation, <http://www.disaster.go.th> (10/03/2005).

### Appendix 3 Damage to Crops

No.	Province	Paddy		Field crops		Fruit tree		Other		Total
		Rais	Baht	Rais	Baht	Rais	Baht	Rais	Baht	Baht
1	Phangnga	33	8,019	-	-	6,640.5	2,450,344.50	-	-	2,458,363.50
2	Krabi	14.5	55,300	5	80,000	40	159,400	-	48,200	342,900
3	Phuket	-	-	5.5	10,500	22	15,908	22	157,738	184,146
4	Ranong	-	-	1,625	658,021	-	-	-	-	658,021
5	Trang	105.5	-	95.5	-	4.75	-	-	-	3,545,000
6	Satun	109.5	219,000	470	940,000	3	6,000	-	-	1,165,000
Total		262.5	282,319	2,201	1,688,521	6,710.25	2,631,652.50	110	205,938	8,353,430.50

Note: 1 rai = 0.4 acre

Source: Department of Disaster Prevention and Mitigation, <http://www.disaster.go.th> (10/03/2005).

### Appendix 4 Damage to Private Enterprise

No.	Province	Stools		Shop		Restaurant		Hotel		Total
		Unit	Baht	Unit	Baht	Unit	Baht	Unit	Baht	Baht
1	Phangnga	648	1,018,000	106	3,710,000	215	7,525,000	93	6,199,000,000	6,211,253,000
2	Krabi	915	2,918,200	50	10,000,000	19	459,880	131	2,670,273,700	2,683,651,780
3	Phuket	2,605	104,200,000	188	177,426,490	65	85,999,625	100	3,143,223,737	3,954,082,932
4	Ranong	42	-	20	390,000	-	-	-	-	830,000
5	Trang	96	1,100,000	-	-	46	170,000	-	-	2,800,000
6	Satun	-	-	-	-	-	-	-	-	-
Total		4,306	109,236,200	364	191,526,490	345	93,984,505	324	12,012,497,437	12,852,617,712

Source: Department of Disaster Prevention and Mitigation, <http://www.disaster.go.th> (10/03/2005).

## Appendix 5 Damage to Infrastructure

No.	Province	Damage to Infrastructure											
		Harbour		Bridge (Concrete)		Wooden bridge		Pipe		Road/Drainage		dike	
		Unit	Cost (Baht)	Unit	Cost (Baht)	Unit	Cost (Baht)	Unit	Cost (Baht)	Unit	Cost (Baht)	Unit	Cost (Baht)
1	Phangnga	53	150,000,000	7	4,200,000	1	195,000	2	1,400,000	22	53,500,000	-	-
2	Krabi	2	30,500,000	2	7,200,000	-	-	-	-	3	7,162,000	-	-
3	Phuket	2	5,000,000	6	2,400,000	0	-	-	-	12	25,260,000	-	-
4	Ranong	25	1,140,000	1	100,000	10	400,000	-	-	29	3,016,000	1	520,000
5	Trang	1	200,000	1	750,000	-	-	-	-	8	918,900	-	-
6	Satun	-	-	-	-	-	-	-	-	3	7,100,000	-	-
Total		83	186,840,000	17	14,650,000	11	595,000	2	1,400,000	77	96,956,900	1	520,000
No.	Province	Damage to Infrastructure (Continue)											
		Dam		Electricity		Pipe water system		Telephone		Other		Total	
		Unit	Cost (Baht)	Unit	Cost (Baht)	Unit	Cost (Baht)	Unit	Cost (Baht)	Unit	Cost (Baht)		
1	Phangnga	2	2,800,000	30	100,000,000	11	10,375,000	5	45,000,000	2	420,000	367,890,000	
2	Krabi	2	68,550,000	2	7,200,000	3	605,000	-	-	14	98,420,786	212,721,903	
3	Phuket	-	-	-	24,000,000	-	-	11	110,000	4	343,080,000	399,850,000	
4	Ranong	1	280,000	-	-	1	350,000	-	-	5	35,862,100	41,668,100	
5	Trang	1	3,282,720	-	-	-	-	-	-	-	-	5,151,620	
6	Satun	-	-	-	-	-	-	-	-	-	-	7,100,000	
Total		6	68,912,720	32	124,184,117	15	11,330,000	16	45,110,000	25	477,782,886	1,028,281,623	

Source: Department of Disaster Prevention and Mitigation, <http://www.disaster.go.th> (10/03/2005).

## Appendix 6 Relief budget of the Office of the Prime Minister

No.	Province	Death (Thai)	Death (20,000 baht/person)		The others Persons	Injury ( In patient) (5,000 baht/person)		Injury (Out patient) (2,000 baht/person)		Unemployed (2,000 baht/person)		Fisherman		Total Baht
			Persons	Baht		Persons	Baht	Persons	Baht	Persons	Baht	Persons	Baht	
1	Phangnga	1,238	1,137	22,740,000	101	291	1,455,000	2,203	4,406,000	5,616	11,232,000	-	-	39,833,000
2	Krabi	357	334	6,680,000	23	78	390,000	2,410	4,820,000	10,681	21,362,000	-	-	33,252,000
3	Phuket	151	187	3,680,000	(36)	125	625,000	1,836	3,672,000	5,717	11,434,000	-	-	19,411,000
4	Ranong	156	152	3,040,000	4	26	130,000	141	282,000	-	-	-	-	3,452,000
5	Trang	3	3	60,000	-	35	175,000	66	132,000	523	1,046,000	-	-	1,413,000
6	Satun	6	6	120,000	-	11	55,000	4	8,000	-	-	11	2,050,000	2,233,000
Total		1,911	1,819	36,320,000	92	566	2,830,000	6,660	13,320,000	22,537	45,074,000	11	2,050,000	99,594,000

Source: Department of Disaster Prevention and Mitigation, <http://www.disaster.go.th>, as of March 9<sup>th</sup>, 2005.

## Appendix 7 Relief Budget of the Ministry of Social Development and Human Security

No.	Province	Families assistance (2,000 baht)		Families assistance (from Province)				Scholarship (3,000 baht)		Total Baht
		Number of family	baht	(1,000 baht/person)		(2,000 baht/person)		person	Baht	
				person	Baht	person	Baht			
1	Phangnga	1,094	1,104,800	-	-	-	-	-	-	1,104,800
2	Krabi	1,046	2,064,000	-	-	-	-	27	40,500	2,104,500
3	Phuket	1,120	750,000	426	426,000	34	68,000	2	6,000	1,250,000
4	Ranong	1,089	2,181,000	-	-	-	-	34	102,000	2,283,000
5	Trang	153	306,000	-	-	-	-	8	24,000	330,000
6	Satun	25	50,000	-	-	-	-	2	6,000	56,000
Total		4,527	6,455,800	426	426,000	34	68,000	73	178,500	7,128,300

Source: Ministry of Social Development and Human Security, as of March 9<sup>th</sup>, 2005.

## Appendix 8 Relief Budget of the Department of Fisheries

Province	Fishing boat		Number of farms (20,000 baht/persons)		Fishing gears (not more than 10,000/person)		Touring boats		Boat farms (200,000 baht/farm)		Total
	Unit	Baht	Unit	Baht	Unit	Baht	Unit	Baht	Unit	Baht	
Phangnga	1,024	71,796,480	1,288	21,843,040	349	2,879,000	0	0	18	4,200,000	100,719,070
Krabi	479	13,804,589	1,052	16,781,845	0	0	0	0	0	0	30,586,434
Phuket	542	23,094,300	418	8,138,400	349	2,981,120	0	0	0	0	34,213,820
Ranong	521	14,683,850	775	10,654,165	845	7,500,090	248	15,251,300	0	0	48,089,405
Trang	869	10,367,803	620	10,486,980	1,526	3,144,200	0	0	0	0	23,998,983
Satun	593	7,423,093	954	17,968,800	1,164	9,095,976	0	0	0	0	34,487,869
Total	4,028	141,170,115	5,107	85,873,230	4,233	25,600,936	248	15,251,300	18	4,200,000	272,095,581

Source: Department of Fisheries, as of March 10<sup>th</sup>, 2005.

## Appendix 9 Relief Budget of the Local Administration Promotion

No.	Provinces	Number of Local Administrations	Number of small entrepreneurs			Number of small entrepreneurs who received help		Total Expenditure (Baht)
			Budget from Department of Local Administration	Accumulate total (person)	Total (person)	Persons	Baht	
1	Phangnga	14	1,130	1,442	2,572	2,572	51,440,000	51,440,000
2	Krabi	5	470	445	915	891	17,820,000	17,820,000
3	Phuket	8	190	453	643	638	12,760,000	12,760,000
4	Ranong	2	96	0	96	96	1,100,000	1,100,000
5	Trang	4	42	0	42	42	830,000	830,000
6	Satun	0	0	0	0	0	0	0
Total		33	1,928	2,340	4,268	4,239	83,950,000	83,950,000

Source: Department of Local Administration Promotion, as of February 9<sup>th</sup>, 2005.

## Appendix 10 Relief Budget of the Ministry of Finance

No.	Province	Amount of money	Funeral costs		Funeral costs of leader of family		Funeral transportation costs		Lost	
			Person	Baht	Person	Baht	Person	Baht	Person	Baht
1	Phangnga	116,218,375	920	13,800,000	320	12,800,000	1	2,600	567	8,505,000
2	Krabi	20,151,300	242	3,630,000	107	4,280,000	5	52,000	10	150,000
3	Phuket	42,083,100	106	1,590,000	40	1,600,000	1	19,000	-	-
4	Ranong	21,705,701	110	1,600,000	48	1,920,000	-	-	-	-
5	Trang	1,960,345	-	-	3	120,000	-	-	-	-
6	Satun	748,930	3	90,000	3	135,000	3	15,700	-	-
Total		202,867,751	1,381	20,710,000	521	20,855,000	10	89,300	577	8,655,000
No.	Province	Amount of money	Lost of leader of family		Injury		Work appliances		Other	
			Person	Baht	Person	Baht	Person	Baht	Baht	
1	Phangnga	116,218,375	186	7,440,000	1,872	3,968,000	3,231	27,969,875	41,732,900	
2	Krabi	20,151,300	8	320,000	1,037	2,172,000	40	273,300	9,274,000	
3	Phuket	42,083,100	-	-	49	127,000	2,479	21,397,000	17,350,100	
4	Ranong	21,705,701	-	-	175	394,000	1,206	10,328,745	7,462,956	
5	Trang	1,960,345	-	-	161	394,000	-	-	1,446,345	
6	Satun	748,930	-	-	3	6,000	6	17,200	485,030	
Total		202,867,751	194	7,760,000	3,297	7,061,000	6,962	59,986,120	77,751,331	

Source: Ministry of Finance, as of March 9<sup>th</sup>, 2005.

## Appendix 11 Relief Budget of the Ministry of Labour

No.	Province	Employment Project		Job placement		Job Relocation		New occupation		Occupation training		Total (Baht)
		Target (persons)	Budget (Baht)	Target (persons)	Budget (Baht)	Target (Persons)	Budget (Baht)	Target (Persons)	Budget (Baht)	Target (persons)	Budget (Baht)	
1	Phangnga	9,800	51,818,000	10,000	100,000	350	105,000	160	1,920,800	1,248	5,616,000	59,571,558
2	Krabi	6,000	31,722,000	6,000	75,000	300	90,000	160	1,920,800	800	3,600,000	37,415,060
3	Phuket	5,000	26,435,000	5,000	75,000	200	60,000	180	2,160,900	6,560	29,520,000	58,262,840
4	Ranong	1,000	5,287,000	1,000	62,500	200	60,000	120	1,440,600	464	2,088,000	8,939,884
5	Trang	100	530,000	500	50,000	100	30,000	80	960,400	464	2,088,000	3,659,544
6	Satun	100	530,000	500	50,000	50	15,000	60	720,300	464	2,088,000	3,404,374
Total		22,000	116,322,000	23,000	412,500	1,200	360,000	760	9,123,800	10,000	45,000,000	171,253,260

Source: Ministry of Labour, as of January 28<sup>th</sup>, 2005.

## Appendix 12 Relief Budget of the Ministry of Education

No.	Province	Orphans								Total	
		2,000 baht		23,000 baht		25,000 baht		Total			
		persons	Baht	persons	Baht	persons	Baht	persons	Baht		
1	Phangnga	325	650,000	173	3,979,000	46	1,150,000	371	5,779,000		
2	Krabi	55	110,000	53	1,219,000	10	250,000	65	1,579,000		
3	Phuket	91	182,000	85	1,955,000			91	2,137,000		
4	Ranong	39	78,000	39	897,000			39	975,000		
5	Trang	20	40,000	20	460,000			20	500,000		
6	Satun	21	42,000	10	230,000			21	272,000		
Total		551	1,102,000	380	8,740,000	56	1,400,000	607	11,242,000		
No.	Province	Impacts								Grand Total	
		2,000 baht		13,000 baht		15,000 baht		Total			
		persons	Baht	persons	Baht	persons	Baht	persons	Baht		
1	Phangnga	-	-	-	-	15	225,000	15	225,000	386	6,004,000
2	Krabi	-	-	399	5,187,000	6	90,000	405	5,277,000	470	6,856,000
3	Phuket	300	600,000	225	2,925,000	18	270,000	318	3,795,000	409	5,932,000
4	Ranong	181	362,000	173	2,249,000	1,029	15,435,000	1,210	18,046,000	1,249	19,021,000
5	Trang	353	706,000	321	4,173,000	843	12,645,000	1,196	17,524,000	1,216	18,024,000
6	Satun	-	-	-	-	1,355	20,325,000	1,355	20,325,000	1,376	20,597,000
Total		834	1,668,000	1,118	14,534,000	3,266	48,990,000	4,499	65,192,000	5,106	76,434,000

Source: Ministry of Education, as of February 25<sup>th</sup>, 2005.