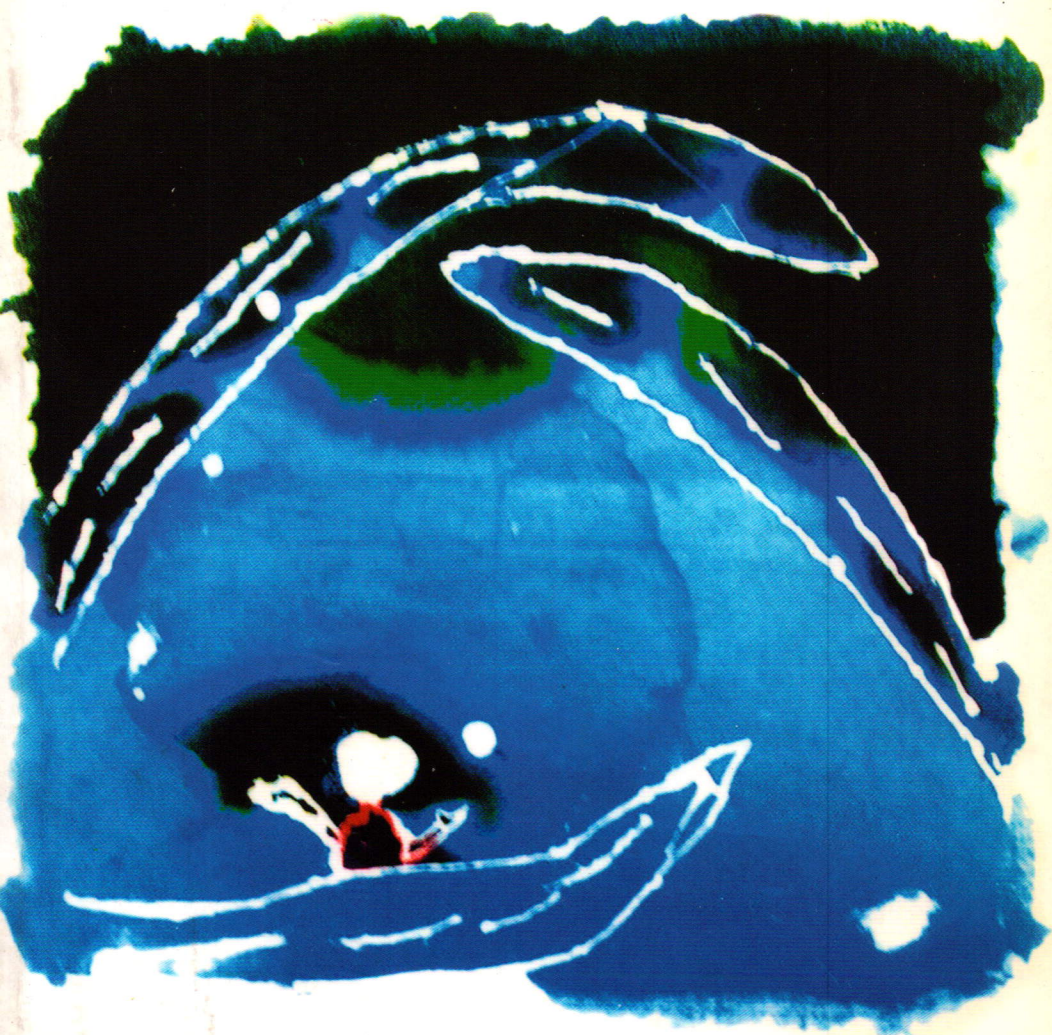


**TSUNAMI 2004**

***Nam Chai Thai***



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**TSUNAMI 2004**

***Nam Chai Thai***

Author

**Karl E. Weber**

## BOOK COVER ILLUSTRATIONS

The illustrations depicted on the front and back covers of this book were created by survivors of the tsunami disaster who are members of the fishing community of Ban Nam Khem in Bang Muang Sub-district of Takua Pa District, Phang-nga Province, Southern Thailand.

To assist the communities devastated by the tsunami, the artist Khun Chumpon Apisuk took the initiative to train members of the youths among survivors on the art of creating batik, using fabric left over after enwrapping corpses. Other artists joined this venture, and the group launched the project of enabling the poverty-stricken youths to become artisans specialized in batik production as a source of livelihood. The artists taught members of the Ban Nam Khem Youth Group the technique of batik painting. This creative activity was also intended to help young survivors to cope with their trauma and express how they had experienced this unprecedented and most terrifying natural disaster.

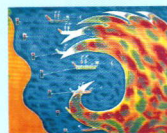
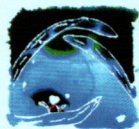
Through the joint efforts of The Siam Society under Royal Patronage, the Office of Contemporary Art, the Concrete House, and the EMPOWER Foundation, and with the active support of the Duang Prateep Foundation, Human Development Foundation, Chum Chon Thai Foundation, Youth Group of Ban Nam Khem,

Community Coordinating Centre of Ban Nam Khem, and Save Andaman Network, an exhibition was mounted.

Entitled *LIFE NOW : Phuea Chiwit Thammachat Andaman* ('For Life and Nature on the Andaman'), the "Exhibition of Batik Paintings from Ban Nam Khem on the Andaman Sea" was held in the premises of The Siam Society under Royal Patronage, Bangkok, 14 to 31 May 2005. Its inauguration, a memorable event in the Thai tradition of a *Mahakam*, with artisans and many other members of the fishing community of Ban Nam Khem participating, was presided over by H.E. Deputy Prime Minister Chaturon Chaisang at the Siam Society, on 14 May 2005.

The front cover shows the reproduction of the batik painting titled "Suenami Si Nam Ngoen / Blue Tsunami" (49 x 49 cm), created by Khun Chob, Ban Nam Khem, in February 2005 (from the Collection of The Siam Society under Royal Patronage).

The back cover shows the reproduction of the batik painting titled "Kronglep Suenami / Tsunami's Claws" (66 x 79 cm), created by Khun Ekalak Boontham, Ban Nam Khem, in February 2005 (from the Collection of Mr. Chatvichai Promadhattavedi).



## PREFACE

*Nam Chai* (*nam* meaning water, the source of life, and *chai* meaning mind as well as heart) has the broadest and deepest meaning in Thai society that cannot be explained in just one or two words of English. Let us briefly retrace our steps into Thai history to gain some perspective.

In rural Thailand, as early as the Sukhothai Period (13<sup>th</sup> into 14<sup>th</sup> centuries AD), each household would have a water jar placed on a low, wooden platform in front of its house. This jar was closed with a wooden lid, on which was placed a ladle made of a halved coconut shell attached to a stick. By custom, anyone thirsty passing by, locals as well as strangers, would be welcome to quench their thirst from this jar and ladle. This being an open invitation, the ones partaking of the refreshment did not have to ask permission. This custom has been upheld in the countryside of northern Thailand to this day.

In the event of personal encounters, the house owners would greet passers-by literally asking ‘Have you eaten any rice yet?’ If the latter signalled that they were hungry, they would be given helpings of sticky rice along with a spicy dip, wrapped into pieces of banana leaves. This kind of provision for the journey, known as ‘*khao ho*’, is common to this day.

Farmers have also upheld the tradition of accomplishing major work, requiring a large labour force, through mutual assistance. In the rice harvesting period, for example, when time is of the essence, farmers would, in turn, come to each others’ assistance. This has been upheld to the day, covering a whole range of activities and known by corresponding terms. These terms include ‘*chuay luea*’, helping ; ‘*kho raeng*’, requesting help ; and ‘*long khaek*’, rotating help.

These traditional practices are manifestations of an innate tendency encapsulated in the term ‘*nam chai*’. Adhering to the principle of ‘*nam chai*’ has been of great benefit to society-at-large. With the passage of time, modernization propelled by the advancement of technology has made for rapid changes, which have in turn affected the Thai outlook and value system. Some have bemoaned these changes that give more weight to material achievements and successes, power and prestige, shunting other values like sharing and doing good without showing off, an attitude circumscribed as ‘*pit thong lang Phra*’, attaching the gold leaves onto the back of the Buddha image when worshipping. This is evidence that old values have remained deeply ingrained in Thai society and culture.

The catastrophe of 26 December 2004 and its devastating impact have, indeed, shown to us that in the 'hour of need' Thai people from all walks of life, officials, volunteers, rich, poor, and those of all religious affiliations rallied to the assistance of survivors and victims by undertaking search and rescue as well as relief activities. Those who could afford to travel to the sites of destruction and despair went there carrying money and material, to offer to those affected and in need. Thousands more who could not travel themselves gave dried and canned foods, clothes, blankets, utensils, medicines and other necessities, largely donated through the good offices of the Thai Red Cross Society under Royal Patronage and other charitable organizations.

Innumerable people anonymously donated cash in response to calls for help disseminated through the mass media, including newspapers as well as radio and

television broadcasts. The anonymous contributions by the public including street cleaners, taxi drivers and the like received and conveyed through the mass media amounted to over 263 million baht, and those received by Government agencies totalled over 2,000 million baht. This generosity resulted in approximate equivalents of US\$56.6 million or €45.3 million.

Local people in and from areas near the disaster sites joined the rescue and relief efforts as volunteers in great numbers. Some of the surviving victims themselves shared their personal belongings such as clothes, blankets, food and water, although scarce, with other needy, hungry and thirsty survivors. Such instances of extraordinary selflessness have abounded and been recorded, often by the very recipients of these spontaneous and compassionate acts.

Bangkok, 22 November 2005

# CONTENTS

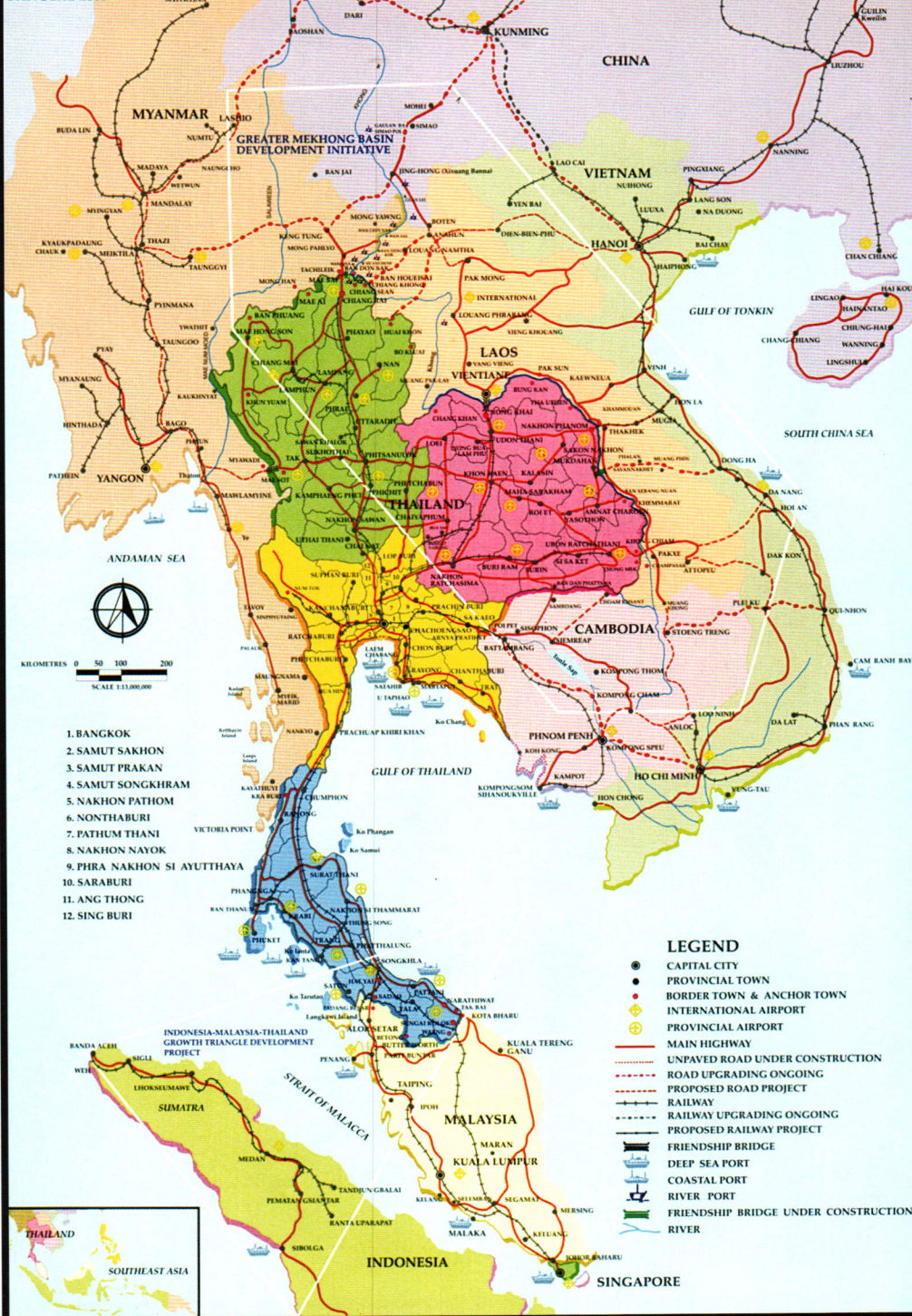
|   | Page |
|---|------|
| <b>PREFACE</b>  | 3    |
| <b>FIVE ANSWERS TO VITAL QUESTIONS <i>EN LIEU</i> OF INTRODUCTION</b> | 9    |
| <b>TSUNAMI OF 26 DECEMBER 2004</b>                                    | 14   |
| ITS CAUSE AND ITS GEOGRAPHICAL REACH                                  | 15   |
| DISASTER IMPACT ON THAILAND'S ANDAMAN SEA COAST AND ISLANDS           | 16   |
| <b>RESCUE</b>   | 37   |
| ROYAL CONCERN AND ASSISTANCE  | 38   |
| ROYAL THAI GOVERNMENT INTERVENTION                                    | 38   |
| <u>Search for and Rescue of Survivors</u>                             | 38   |
| <u>Tsunami Disaster Victim Logistics Centre</u>                       | 40   |
| <u>Rescue Operations by the Royal Thai Armed Forces</u>               | 42   |
| <u>Rescue Operations by the Royal Thai Police</u>                     | 44   |
| <u>Mental Health Rehabilitation for Disaster Victims</u>              | 44   |
| <u>Rescue Operations by the Phang-nga Provincial Administration</u>   | 46   |
| <u>Rescue Operations by the Phuket Provincial Administration</u>      | 46   |
| <u>Rescue Operations by Foundations</u>                               | 48   |
| <u>Rescue Operations through Private-sector Initiative</u>            | 48   |
| <u>Forensic Services</u>  | 48   |
|   | 5    |

|  | Page |
|--|------|
| SURVIVORS' APPRECIATION OF RESCUE AND EMERGENCY AID  | 52   |
| OFFICIAL RECOGNITION REFLECTING GRATITUDE FOR ASSISTANCE AND COMPASSION                          | 56   |
| <b>RELIEF</b>  | 58   |
| ROYAL CONCERN AND ASSISTANCE   | 59   |
| ROYAL THAI GOVERNMENT RELIEF ASSISTANCE  | 62   |
| <u>Royal Thai Armed Forces Relief Operations</u>   | 64   |
| <u>Phang-nga Provincial Administration Relief Operations</u>                                     | 65   |
| <u>Phuket Provincial Administration Relief Operations</u>  | 73   |
| MASS MEDIA SUPPORTIVE INTERVENTION   | 78   |
| OFFICIAL RECOGNITION OF ASSISTANCE IN DISASTER RESCUE AND RELIEF AND INTERNATIONAL CONTRIBUTIONS | 78   |
| <b>REHABILITATION</b>  | 81   |
| ROYAL CONCERN AND ASSISTANCE   | 82   |
| <u>Scholarships for Orphans</u>  | 82   |
| <u>Livelihood</u>  | 82   |
| <u>Reconstruction of the Built Environment</u>   | 88   |
| <u>Enhancing Disaster Awareness and Preparedness</u>   | 90   |
| REHABILITATION THROUGH THE THAI RED CROSS SOCIETY UNDER ROYAL PATRONAGE                          | 91   |



|  | Page |
|--|------|
| <u>Support for Orphans</u>   | 91   |
| <u>Livelihood</u>  | 91   |
| <u>School Education</u>  | 92   |
| <u>Housing &amp; Infrastructure Rehabilitation</u>   | 93   |
| <b>REHABILITATION BY THE ROYAL THAI GOVERNMENT</b>   | 94   |
| <u>Reconstruction and Restoration by<br/>the Royal Thai Armed Forces</u>                               | 94   |
| <u>Infrastructure</u>  | 95   |
| <u>Appropriate Technology : Boat Building</u>  | 95   |
| <u>Livelihood</u>  | 97   |
| <u>Mental Rehabilitation for Disaster Victims</u>  | 97   |
| <u>Restoration of the Natural Marine Environment</u>   | 98   |
| <u>Precautions Supported by the Ministry of Foreign Affairs</u>  | 98   |
| <u>Rehabilitation Implemented by<br/>the Phang-nga Provincial Administration</u>                       | 99   |
| <u>Rehabilitation Implemented by<br/>the Phuket Provincial Administration</u>                          | 102  |
| <b>TSUNAMI-RELATED INTERNATIONAL TECHNICAL ASSISTANCE</b>  | 103  |
| <b>REGIONAL AND NATIONAL END-TO-END EARLY WARNING SYSTEM FOR TSUNAMI<br/>AND OTHER NATURAL HAZARDS</b> | 105  |
| <i>REFERENCES</i>  | 111  |

BANGLADESH



## **TSUNAMI 2004** *Nam Chai Thai*

The ferocious earthquake of 26 December 2004, which triggered the giant, disastrous waves known as tsunami, the Japanese word for “harbour wave”, that forged into the Andaman Sea and devastated some of Thailand’s coastal areas and islands with diabolic force, alerted the world community to how precarious life on the edge of paradise could be. Under the murderous impact of the tsunami, far too many unfortunate local people and visitors perished or went missing. Many more traumatized survivors had been injured, were bereaved, suffered loss of or damage to their property, or were deprived of their source of livelihood. That terrible disaster has necessitated both reactive and pro-active interventions, in virtually all spheres of the natural and physical environment.

## **FIVE ANSWERS TO VITAL QUESTIONS** *EN LIEU OF INTRODUCTION*

As a reaction to the terrible tsunami, the need for information, felt not solely by policymakers but particularly by lay-people, covers five facets that are of vital significance. The salient questions are [1] in how far the occurrence of giant waves is germane to the ecosystem of the Andaman Sea; [2] how public alertness could be enhanced in parallel with a state-of-the-art early warning system; [3] how some parts of the natural environment were adversely affected and in need of rehabilitation while others remained unscathed; [4] how nature has restored, recreated, and created ecosystem components; and [5] what proactive ecological strategies as well as measures have been identified so as to safeguard against any future loss of life.



*In how far is the occurrence of giant waves germane to the ecosystem of the Andaman Sea ?*

First and most of all, by far most local residents and visitors along the coast and on the islands of the Andaman Sea had no knowledge of any occurrence of such giant waves. To date, 80 percent of all tsunamis occurred in the Pacific Ocean, and few only in the Indian Ocean, of which the Andaman Sea is part. For the Indian Ocean, the recurrence of 10-metre waves was extrapolated at an interval of about 1,000 years.<sup>1</sup>

People were, hence, caught unaware of the monstrous impact of a tsunami, triggered by one of the strongest earthquakes on record at the bottom of the ocean. The seismic slip of 26 December 2004 sparked the waves, with the rupture running the length of 1,200 km.<sup>2</sup>

*How could public alertness be enhanced in parallel with the introduction and operation of a state-of-the-art early-warning system ?*

Five lessons imparted by and learnt from nature proved to ensure survival. The following experiences render proof of the feasibility, not to say necessity, to recognize the need for environmental conservation, as a matter of principle, and

to heed nature's signals, which would be flashed in the process of any such rare force gathering virulence, thus allowing for time to escape.

A herd of some 100 heads of buffalo grazing on the Muang Kluang Peninsula in Kapoe District of Ranong Province, which was the coastal strip hit most violently by the tsunami, stampeded in panic towards the inland hills, well before the giant waves reached the shore. Villagers ran after their livestock for fear of losing it. As a result, the livestock survived, and nobody perished under the onslaught.

In like manner, tamed elephants trained to carry tourists around for sight-seeing began to trumpet, "cry" and wail, when they sensed the giant waves coming, well before they were visible. Escaping into the hills with their mahouts and charges of tourists riding on elephant backs, followed by alerted people, human and animal lives were saved.

When the ocean receded before the giant waves surged and hit, most people witnessing its perplexing disappearance did not understand the ominous warning sign. Many even wandered out onto the unexpected mudflats in pursuit of the receding sea, to marvel at this extraordinary phenomenon.

---

<sup>1</sup> Benfield Hazard Research Centre, London.

<sup>2</sup> The seafloor bulge unleashed a wave that surged through the Indian Ocean. Initially, the energy of such a wave is distributed throughout the water column, and surface perturbation is small. Only when the water grows shallow, near the coast, does the wave emerge on the surface as a tsunami.

The Moken<sup>3</sup>, a seafaring ethnic group native to the eastern longitudes of the Andaman Sea, have preserved in their oral tradition a body of life-saving indigenous knowledge that is based on experience and observations gathered since time immemorial. It enabled these “sea-wise” people to become alerted to the imminent danger, take necessary precautions, and survive, albeit losing their immovable properties.

A hitherto neglected dimension of the detrimental impact of encroachment on protected coastal areas became obvious. By far the worst damage to coral reefs and sea fans at affected sites was caused by debris and detritus of modern civilization. Objects of all sorts and sizes had been swept off the largely illegally built-up shorelines on the mainland and island coasts.

*Why did some sites of the natural environment remain unscathed, and how have adversely affected sites been rehabilitated?*

Nine of the 17 marine national parks remained unaffected by the tsunami, with a clustering of unscathed nature reserves alongside the peninsular coast and in the territorial waters of the provinces of Trang and Satun. In Satun Province, many beaches and islands were not affected, with their coral reefs in shallow waters remaining undamaged and deep-

water coral reefs untouched.

Three natural ecosystems are singled out here for closer inspection, including [1] the fragile terrestrial ecosystem, [2] the mangrove forests, and [3] the coral reefs.

On high ground, priority was given to recovering those freshwater sources which had been swamped by giant waves and contaminated with saline water, by removing salty mud from top soils, rejuvenating vegetation as the vital source of fodder for wildlife, and rehabilitating agricultural lands.

Post-disaster assessments made evident that shores originally covered with mangrove forests yet lost to encroachment well before the tsunami impact, equalling 30 percent, were far worse ravaged than shores with existing, albeit tsunami-damaged mangrove forests. While restoring vast tracts of mangroves is feasible by assisting nature to heal the wounds, the reclaiming of encroached mangrove forests for rehabilitation is an obvious necessity yet might prove difficult.

Soon after the giant waves had ravaged certain sections of mainland and island coasts, surveys rendered evidence that the waves had an adverse impact largely on coral reefs in shallow waters at some sites along the shorelines, while the effects on deep-water ecosystems

---

<sup>3</sup> A native ethnic group of originally nomadic people, known for their fishing, diving, and navigating expertise and skills. They call themselves *Iraklahoi*, and are also known as *Chao Le* or *Chao Nam* in Thai, *Orang Laut* in Malay, and somewhat casually as “Sea Nomads” or “Sea Gypsies”.

were much less damaging. While many areas were unscathed, in others minor fractions of between five and 20 percent of the coral reefs sustained damage. This explains why marine life in the areas surveyed after the disaster was found to be largely intact.<sup>4</sup>

While some broken coral parts were seemingly doomed to perish under thick layers of sand, the summer monsoon would wash out the sand. Young and new coral species would cling to the reef remains and grow. Those corals only turned-over were beginning to recover. This was ensured by sealing off certain sites for wholesome regeneration. Although overall minor proportions of corals were destroyed, it was deemed mandatory to remedy the loss of habitat for marine life and, hence, restore the source of livelihood of fishing communities. Sea fans disconnected by the impact of giant waves were propped up by fastening them onto the sea bed.

*How does nature restore, recreate, and create ecosystem components ?*

Earth's surface is made up of big

crustal slabs that float on a sea of melted rock. Over ages, this churning sea moves the plates. The type of geological process that caused the earthquake and the *tsunami* is an essential characteristic of the Earth. Waves are the inevitable side effects of the constant recycling of the planetary crust, which produces a lush, habitable planet. The diabolic tsunami may prove to be an ecological boon for coastal areas, over the coming decades. Huge waves can distribute rich sediments from river systems across coastal plains, making the soil richer. Its fertility is conducive to the growing of coffee trees, sugar cane, hevea ('para rubber') trees, coconut palms, oil palms, pepper vine, tea trees and cocoa trees.

*What proactive ecological strategies as well as measures ought to be taken so as to safeguard particularly against any future loss of life ?*

Ecological impact assessments conducted by national as well as international organizations were focussed on vital aspects of environmental conservation. For example, a Thai – Swedish team of experts identified high-risk coastal areas

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<sup>4</sup> The coral bleaching reported by the Phuket Marine Biological Centre (PMBC) in June, 2005 was not caused by the tsunami. As explained by the PMBC, coral bleaching would occur in periods of extraordinarily calm sea, very clear water and sky, exposure to solar irradiance, localized rise in water temperature, and high penetration of UV radiation. The spectacular colour of healthy coral comes from microscopic single-celled algae called *zooxanthellae* that live within the coral tissue and manufacture food for the coral. Coral and algae work together to generate limestone skeletons, which accumulate to form a framework on which countless plants and animals settle, creating one of the most complex, species-rich and productive ecosystems. When the coral is stressed, this symbiotic relationships breaks down and the coral expels the *zooxanthellae*. The coral then loses its colour and becomes bone-white. Coral bleaching occurred worldwide, every three to four years. The year 1998 was a disastrous one for the Pacific and Indian oceans, the Mediterranean, Red, and Caribbean seas, and the Gulf of Mexico.

that are exposed to erosion as well as destruction by tidal waves and require environmental restoration mainly through renaturation by planting mangroves.

Mangrove forests serve not only as an important natural protective barrier against waves and storms, but are the breeding ground of aquatic life. They are vital for the conservation of marine resources and, therefore, an ecological necessity with a view to realizing the long-term Millenium Development Goals (MDGs) under the United Nations Development Programme (UNDP). Equally important is the ecological restoration of beaches. By nature, two almost parallel lines of sand dunes act as physical barriers to protect the shore ecosystem. Where such sand dunes were flattened or used as building ground, they need to be restored. Moreover, as jointly appraised by the Food and Agriculture Organization (FAO) of the United Nations, the United Nations Development Programme (UNDP) and the World Bank, the future development of sustainable eco-tourism and the recovery as well as diversification of the livelihood of fishing communities will heavily rely on the recovery and regeneration of the coral reefs in shallow, coastal waters.

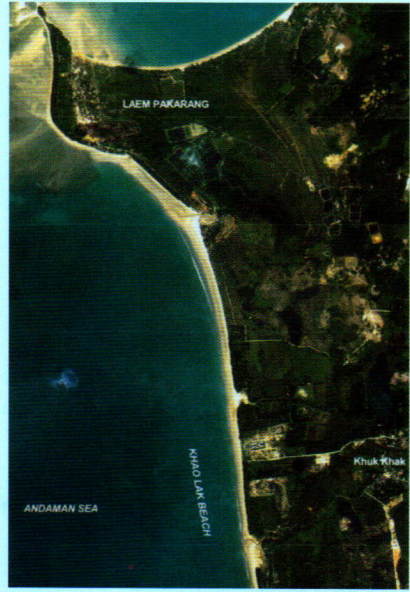
Resilience on the part of local people and restoration as well as conservation of the environment should be reconciled with the exigencies of human habitat and the highly desirable, ecologically salutary variant of tourism. Equipped with a state-of-the-art early warning system and alertness, living and working as well as holidaying or vacationing will become feasible and enjoyable on this safeguarded edge of paradise.

### Thailand / Northern Khao Lak Bay

Ikonos - January 30, 2003

Pre-Disaster Image

1:12.500



Ikonos - January 30, 2003

Post-Disaster Image

1:12.500



## TSUNAMI OF 26 DECEMBER 2004

Three aspects of the disaster are addressed. Briefs on its cause and geographical reach train the perspective on the impact within that part of the Andaman Sea and its coast which is part of Thailand's territory. The impact of the tsunami is related in terms of loss of life, injuries, shattered livelihood, damage to the natural environment, destruction and damage of the built environment, and economic losses.



Owing to the limited availability of documented information and data, the evidence presented hereunder is of exemplary nature. It is understood that many more individuals, locations, agencies, donors, foundations, organizations, enterprises, and other bodies were affected and have been involved, as it were. Any omission is, therefore, not an oversight but the invariable consequence of the necessity to produce this document at short notice, within four weeks, during late October through November, 2005.





### ITS CAUSE<sup>5</sup>

The earth's crust is divided into giant rafts of rock called tectonic plates. These twelve individual plates are always moving, driven by the convection of heat from within the planet. At plate boundaries denser oceanic plates slip under continental plates in a process known as subduction. The India Plate is part of the huge Indo-Australian Plate, which underlies the Indian Ocean and the Bay of Bengal, and is drifting north-east at an average of six centimetres a year. The India Plate meets the Burma Plate at the Sunda Trench off Sumatra. There, the India Plate has been slipping beneath the Burma Plate for millions of years, one plate pushing against the other until something has to give.<sup>6</sup>

### ITS GEOGRAPHICAL REACH

At 07.58:53 local time, on 26 December 2004, the slow build-up of pressure caused by the constant grinding of the two plates resulted in a massive earthquake. Some 1,200 kilometres of the faultline slipped about 15 metres along the subduction zone where the India Plate dives under the Burma Plate. This huge rapture is known as a 'megathrust' and produced an earthquake that lasted for more than four minutes and measured 9.2 on the Richter scale, making it one of the most violent on record.<sup>7</sup>

#### Its Course and Reaches across the Indian Ocean

Seconds after the quake, the energy

<sup>5</sup> Geoff Tibballs, *TSUNAMI. The World's Most Terrifying Natural Disaster*. London: Carlton, 2005. ISBN 1-84442-412 X. 128 p. / Henceforth referred to as Tibballs, TSUNAMI in brief.

<sup>6</sup> Tibballs, TSUNAMI, pp. 13-14.

<sup>7</sup> Tibballs, TSUNAMI, p. 14

it released – the equivalent of 10,000 Hiroshima atomic bombs – was transferred to a water column above the ocean floor. In addition to the sideways movement between the plates, the seabed is estimated to have risen by several metres as a result of the quake, thereby displacing millions of tons of water above it. As the uplifted area collapsed, the water gushed away from it, creating devastating tsunami waves.<sup>8</sup>

This earthquake occurred at a depth of only 30 kilometres, as a result of which there was no geological cushion. The tsunamis radiated outwards along the entire length of the rupture, greatly increasing the area over which they impacted. Since the 1,200 kilometres of faultline affected by the quake ran in a north-south direction, the tsunami waves were at their strongest from east to west. The water was soon powering towards coastlines all around the Indian Ocean. Within just 15 minutes of the earthquake, the tsunami had struck Aceh Province in Sumatra, 155 miles northeast of the epicenter.<sup>9</sup>

### Its Impact on the Andaman Sea

Fifteen minutes later, it hit the Andaman and Nicobar islands and then Malaysia. An hour and a half after the quake, the tsunami hammered the beaches of Thailand, its arrival there delayed by the fact that the tsunami travelled more slowly in the shallow

waters of the Andaman Sea off Thailand's west coast.<sup>10</sup>

### DISASTER IMPACT ON THAILAND'S ANDAMAN SEA COAST AND ISLANDS

Across the six provinces of Thailand's Andaman Sea coast, namely Ranong, Phang-nga, Phuket, Krabi, Trang and Satun, many coastal areas and islands in their territories were affected by the tsunami. All in all, some 25 of 27 coastal districts of altogether 41 districts in those provinces, therein 122 coastal sub-districts (out of the total of 219) with 412 lowest-level local administrative units, villages, located in the coastal area, suffered destruction, devastation, or damage.<sup>11</sup>



<sup>8</sup> Tibballs, *TSUNAMI*, p. 14.

<sup>9</sup> Tibballs, *TSUNAMI*, p. 15.

<sup>10</sup> Tibballs, *TSUNAMI*, p. 15.

<sup>11</sup> December 26, 2004. *The Tsunami on Phuket*. Produced by Phuket Province. Phuket, 2005. Thai and English. 136 p. / p. 34. / Henceforth referred to as *Tsunami Phuket* in brief.



The tsunami caused losses, damages and suffering to extents that could hardly be fathomed. Its trails of devastation left people and the environment scarred. Whatever efforts have been made to measure the disastrous impact, figures and amounts remain estimations that most likely understate the extent to which much of that which mattered was laid to waste.

### Loss of Life

The misery caused by the loss of people who perished under the impact of the tsunami exceeds, by far, the number of those reported dead or recorded as missing. It has remained tangible in terms of quality of life to all those who deplore the loss of relations and friends.

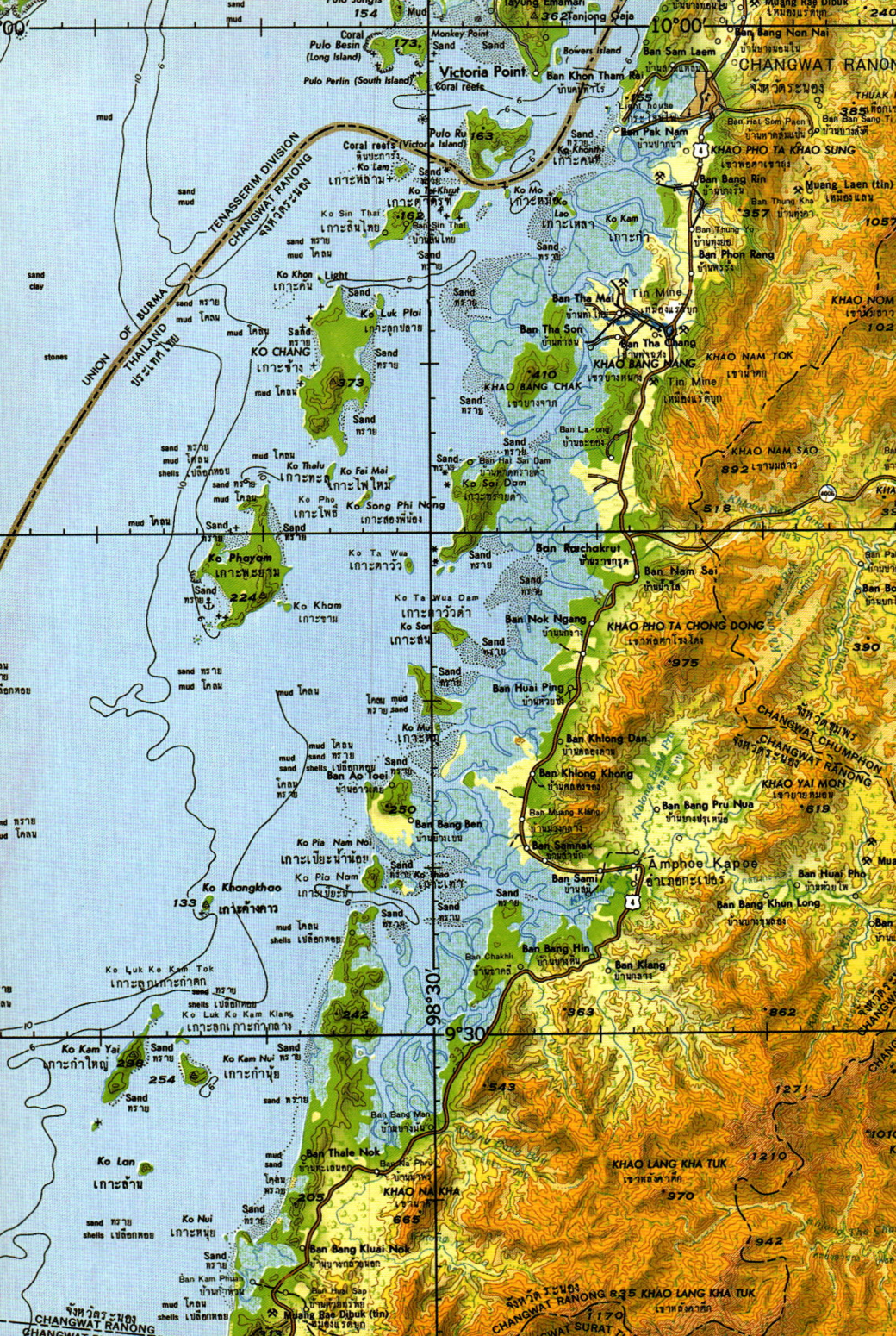
By bare statistics, 5,395 people died as evident from the number of corpses retrieved along the peninsular coast, on and near islands, and in the sea within the territories of the six provinces of Satun, Trang, Krabi, Phuket, Phang-nga and Ranong. Among the identified dead were almost equally many Thai (1,925) and foreigners (1,953), with an additional, large number of unidentified corpses (1,517). By adding the number of people registered as missing (2,965) and assuming that they perished, the number

of dead victims amounted to 8,360. Accordingly, the number of Thai victims rose to 3,948 and that of deceased foreigners to 2,895. Altogether 8,457 people who had suffered injuries that required medical treatment were, hence, recorded. They included 6,065 Thai and 2,392 foreigners.<sup>12</sup>

In comparison, among the six provinces facing the Andaman Sea, the death toll was highest in Phang-nga Province. By bare statistics, 4,225 people died as evident from the number of corpses retrieved along the peninsular coast, on and near islands, and in the sea within the territory of Phang-nga Province, which encompasses the Similan and Surin archipelagos as well as numerous solitary islands. Among the identified dead were more foreigners (2,144) than Thai (1,389), with an additional, large number of unidentified corpses (1,722). By adding the number of people registered as missing (1,685), among them Thai (1,362) and foreigners (323), and assuming that they perished, the number of dead victims amounted to 5,910. Accordingly, the number of Thai victims rose to 2,751 and that of deceased foreigners to 2,467. Altogether 5,597 people who had suffered injuries that required medical treatment were, hence, recorded. They included 4,344 Thai and 1,253 foreigners.

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<sup>12</sup> Tsunami Phuket, pp. 34+37.



The coast of Ranong Province was the worst hit area within Thailand. Of the province's five districts, three were affected. Of their 17 sub-districts eight sustained devastation or damage.

Of the eight districts of Phang-nga Province, the five mainland coastal districts of Khura Buri, Takua Pa, Thai Mueang, Takua Thung as well as Mueang and the one island district of Ko Yao were severely hit by the tsunami. Altogether 69 villages in 19 of the altogether 36 sub-districts in the said districts were ruined. Takua Pa district had sustained the brunt of the giant waves causing horrendous loss of life and the gravest damage in 17 villages of three of its eight sub-districts. It was in Takua Pa district, where the death toll was exceedingly high. In its three coastal sub-districts 3,808 people died. Among the survivors were 4,210 injured who required medical treatment and, hence, were registered.

The disastrous impact was aggravated by the death of some 80 persons who had been trained and posted to lead or assist local communities particularly in emergency situations. They included sub-district chiefs, village chiefs, civil servants such as local administration officers, teachers, police officers, public health service officers, soldiers, and many public health volunteers (29).<sup>13</sup> Among the dead were 225 children of schooling age. While the corpses of 114 were

retrieved, the bodies of another 111 remained missing, were lost. Of the injured children, 93 required medical treatment.<sup>14</sup>

In Phuket Province, comprising the main island of Phuket and small islands within its provincial, maritime territory, 279 corpses were retrieved, among which 151 were identified as bodies of Thai people and 111 as bodies of foreigners; the remaining seven corpses could not be identified. By adding the number of people registered as missing (627) and assuming that they perished, the number of dead victims amounted to 906. Accordingly, the number of Thai victims rose to 407 and that of deceased foreigners to 482. Within the jurisdiction of Phuket Province, the official record shows 1,111 people treated for injuries, including 591 Thai and 520 foreigners.<sup>15</sup>

Data figured in the comprehensive documentations of the tsunami's impact on the provinces of Phang-nga and Phuket, in particular, reflect the status of recorded victims, i.e. casualties, missing persons and injured survivors, as of the end of February, 2005. More recent and sporadic evidence particularly through searching and retrieving corpses have increased the death toll.<sup>16</sup>

### Injuries

The Ministry of Public Health set

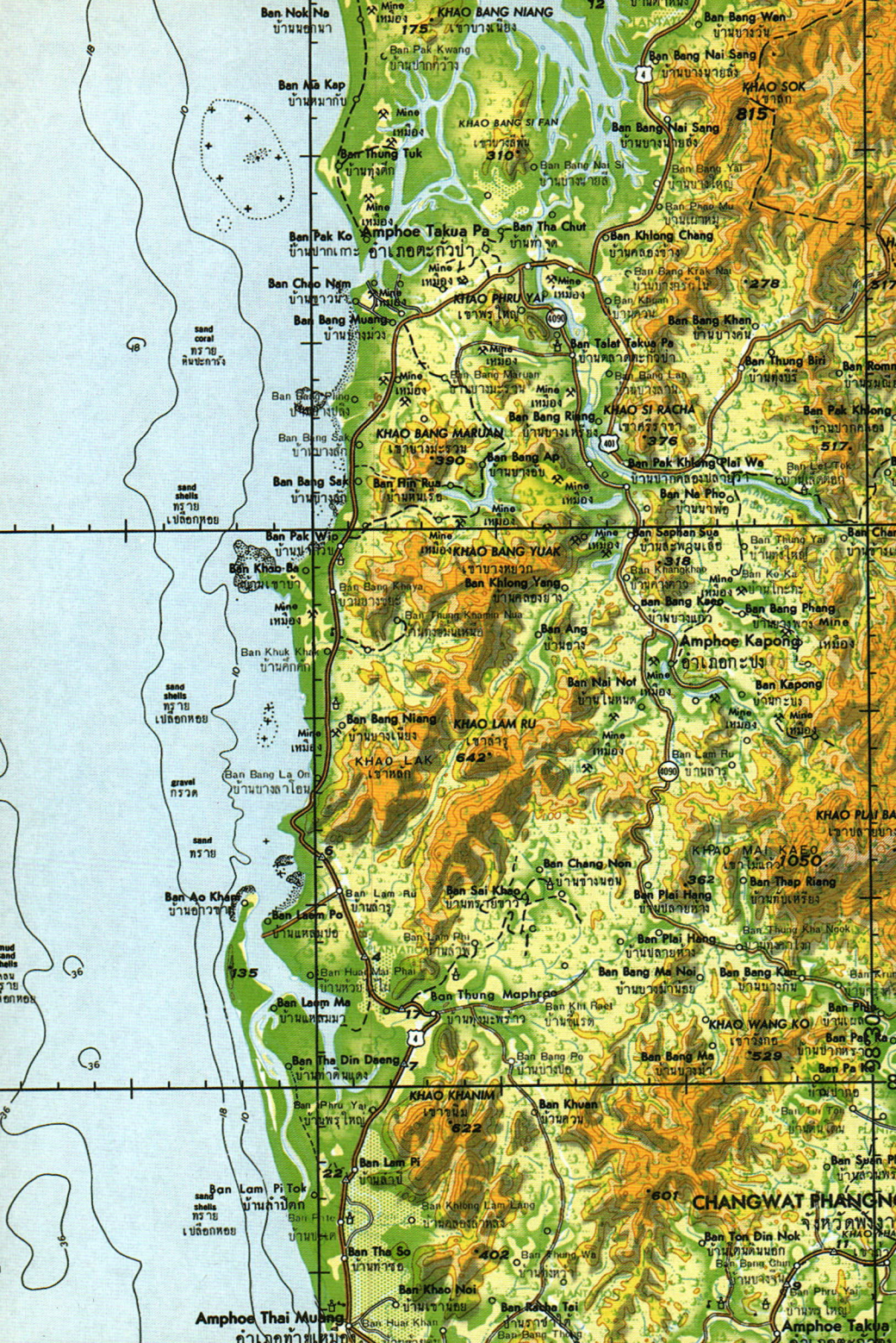
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<sup>13</sup> Phang-nga 1<sup>st</sup> Year Tsunami memorial. Tsunami in Phang-nga. T&D Studio Phang-nga / EPAC Co., Ltd., Phang-nga / Bangkok, (2005). Thai and English. ISBN 974-93463-1-9. (18) + 118 p. / p. 5. Henceforth, referred to as Phang-nga Tsunami in brief.

<sup>14</sup> Phang-nga Tsunami, p. 33.

<sup>15</sup> Tsunami Phuket, pp. 34+37.

<sup>16</sup> Tsunami Phuket, pp. 62-63.



up three centers, one each at Wachira Phuket Hospital, Krabi Hospital and Phang-nga Hospital, to treat the injured and resuscitate the drowned. Wachira Phuket Hospital implemented its “Golden Plan”, an emergency strategy developed to cope with natural disasters. Doctors, nurses and other staff members were mobilized to stand by at many sections. Its emergency mobile physician team and the emergency Narenthon Andaman Call Centre team worked to offer first aid and transfer patients to hospitals. A “war room” was set up for coordination and planning. Teams of physicians from outside and volunteers joined these efforts, all in all numbering 1,127 persons. The hospital set up a volunteer register system to make best use of volunteers’ specializations. As the records show, 75% of the victims had suffered abrasions to their body, and 25% were in need of hospitalization to receive treatment of pneumonia contracted from choking on water, soil or mud, and of wound infections. Some of the seriously injured patients needed surgery, and

others required splints to fasten fractured bones.<sup>17</sup>

### Shattered Livelihood

The number of people who were displaced by the tsunami disaster stood at 58,550, who constituted some 12,480 households, as of the end of February, 2005.<sup>18</sup>

In Takua Pa District alone, 1,749 households with a total of 8,917 persons were victimized by the tsunami. They equalled 40 percent of the 4,394 households in Phang-nga Province directly and severely affected and 47 percent of their altogether 19,509 persons.<sup>19</sup> Worst of all, the tsunami left 422 children orphaned, of whom 45 lost both parents and 377 one parent.<sup>20</sup>

Fishery has been the economic mainstay of the majority of the local population along the peninsular coast and on the many islands. Fishing communities not only suffered the loss of lives of those many fishermen whose corpses were retrieved or who remained missing but also were deprived of vital fishery equipment. The losses of fishing boats and



<sup>17</sup> [Tsunami Phuket](#), p. 55.

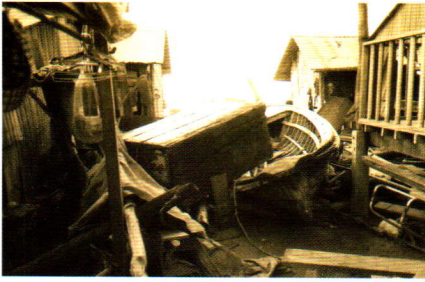
<sup>18</sup> [Tsunami Phuket](#), p. 34

<sup>19</sup> [Phang-nga Tsunami](#), p. 5.

<sup>20</sup> [Phang-nga Tsunami](#), p. 33.







vessels left surviving members of fishing communities deprived of their means to make a living. Boats and vessels tossed ashore or sunk in mudflats were badly damaged, requiring major repair. Affected survivors faced sudden, insurmountable hardship. Likewise, the enterprises of local people operating aquaculture in coastal waters were devastated.

The coastal area of Phang-nga Province, for example, with its steep mountain slopes dissected by streams, narrow flat-bottomed shores dotted with marshes, seamed by offshore islands, all of which resembles Sweden's skerry coast, has been the natural habitat of aquatic life. Its marine resources have attracted people to make a living, since time immemorial. Native sea nomads, known as Moken or Chao Le, old Thai communities engaged in coastal fishery, staff of aquaculture enterprises and crew members of commercial fish trawlers were among the victims.<sup>21</sup> Survivors' livelihood was at risk upon the loss of 2,627 fishing boats, including 372 trawlers and 2,255

dories<sup>22</sup>. Facing the destruction of their enterprises were 1,040 fishermen, 2,762 persons engaged in aquaculture, and 24 traders marketing seafood in bulk.<sup>23</sup>

The extent of the damage to agriculture is exemplified by data for Phang-nga Province. In total, some five hectares of paddy land and 1,063 hectares of crop plantation<sup>24</sup>, as well as 23 hectares of pasture were ruined<sup>25</sup>. The loss of livestock reported by 466 enterprises amounted to 488 heads of large ungulates (cattle and buffaloes), 1,209 heads of small ungulates (sheep and goats), 5,126 heads of small livestock (pigs), and plenty of fowl (approximately 18,000 chicken, 4,256 ducks and 222 geese).<sup>26</sup>

In addition to the largely self-employed, economically active members of farming and fishing communities, provinces such as Phang-nga had a large employee labour force. Many locals and large numbers of migrant workers from other regions of Thailand as well as from neighbouring countries were employed in either the tourism and hospitality or the construction industries. Worst affected were 4,543 employees of 170 enterprises which collapsed under the tsunami's impact, in which 334 employees died and 375 of them remained missing, totalling a loss of 709 lives. Another 123 employees survived with injuries. In 819 severely damaged enterprises, 7,762 employees lost their job.<sup>27</sup>

<sup>21</sup> [Phang-nga Tsunami](#), p. 23.

<sup>22</sup> Dory, a flat-bottomed boat with high flaring sides, sharp bow, and deep V-shaped transom.

<sup>23</sup> [Phang-nga Tsunami](#), p. 6.

<sup>24</sup> [Phang-nga Tsunami](#), p. 6.

<sup>25</sup> [Phang-nga Tsunami](#), p. 27.

<sup>26</sup> [Phang-nga Tsunami](#), p. 27.

<sup>27</sup> [Phang-nga Tsunami](#), p. 41.

sand  
ทราย

Ko Bangu

เกาะบางู

(244)

Ko Similan

เกาะสีมิลัน

sand  
shells  
โคลน  
เปลือกหอย

Ko Payu

เกาะปายู

(199)

Ko Miang

เกาะเมียง

(145)

sand  
coral  
ทราย  
หินปะการัง

Ko Payan

เกาะปายัน

(130)

Ko Payang

เกาะปายัง

Ko Huyong

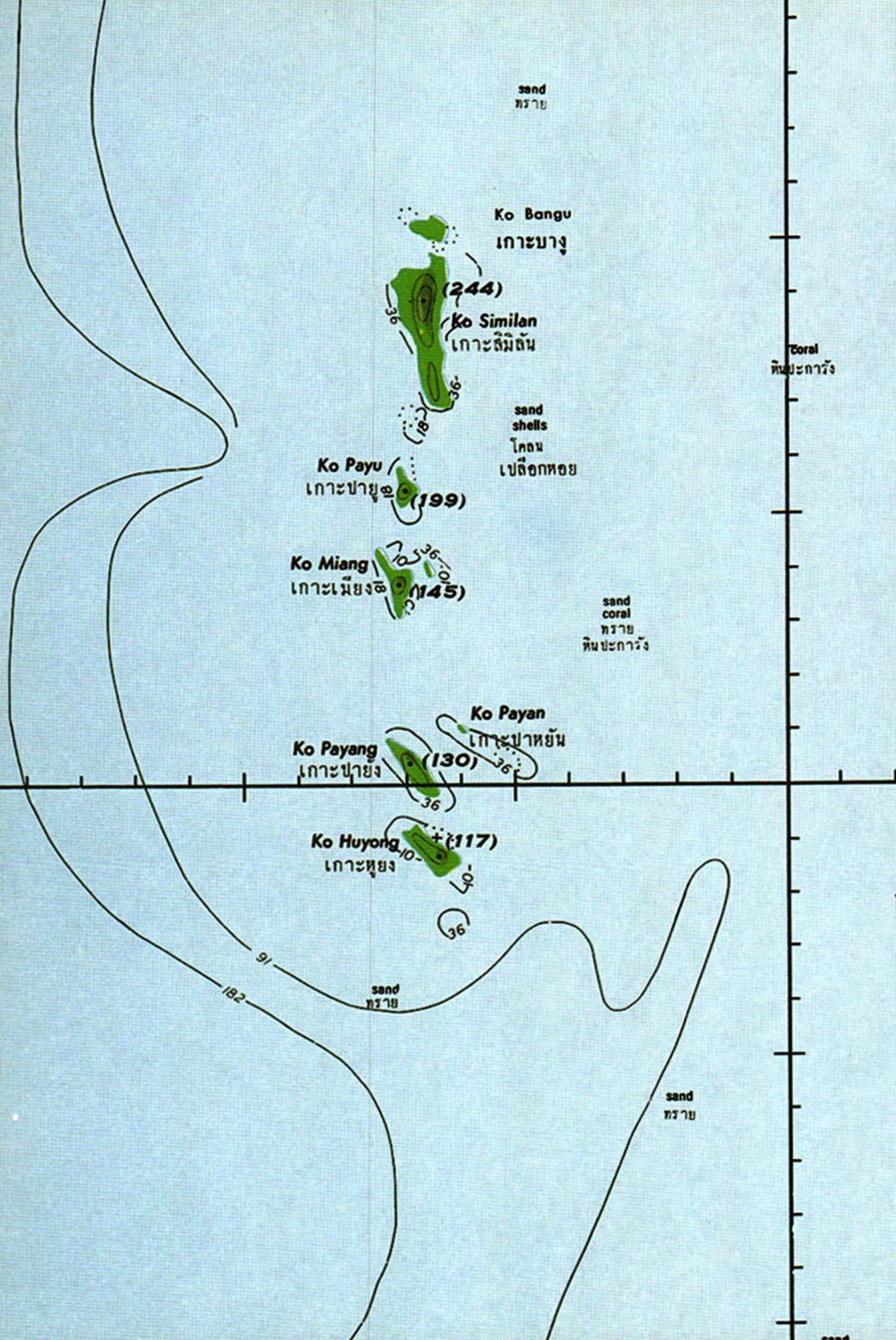
เกาะฮุยอง

(117)

sand  
ทราย

sand  
ทราย

Coral  
หินปะการัง





Two examples were reported from Phuket Province. In Chalong Sub-district, Mueang District, and in Sakhu as well as Mai Khao sub-districts, Thalang District, farmland ruined by saltwater intrusion totalled 3.5 hectares. The beach forests were devastated. Also on Phuket Island, many freshwater wells and other such sources had been inundated with seawater and became unusable. Fortunately, artesian wells were indirectly affected, and the artesian well water supply system was not greatly damaged.<sup>30</sup>

### Damage to the Natural Environment

Particularly with regard to the impact of the tsunami, the distinction between terrestrial and marine environment is made. Natural resources on land which were badly affected are soil and water. The seawater that inundated the land has had a detrimental impact on soil quality by causing salinity. In some areas, the seawater was violently washed into the land to the effect of creating a tideway. Any such tideway has made saltwater flow continuously even farther into the land and seeping into the soil. This has increased salinity and made agricultural land unsuitable for growing crops.<sup>28</sup> The growing of field crops, vegetables, fruit crops, trees and even grass for fodder became unfeasible. Also, ponds used to store supplies for consumption were filled with brackish water.<sup>29</sup>

A report on the marine and coastal aquatic resources in Phuket Province covered mangrove forests, sea-grass beds, and coral reefs. A part (1.6 hectare) of the mangrove forest adjacent to the Khlong Mudong National Mangrove Forest Reserve was damaged. The sea-grass bed at Laem Sai was slightly damaged. Sea-grass near Ban Tha Chat Chai and Ban Pak Khlong Yid, Mai Khao Sub-district, Thalang District, was covered with sand. All these spots were expected to recover naturally. Most of the coral reefs near Phuket Island and the surrounding islands of Phuket Province were not or only slightly damaged, except for a spot with coral reefs to the south of Patong Beach which was damaged, with destruction of parts ranging from 10 to 50 percent. This was visibly caused by the impact of cars, building components, and uprooted trees that had been dragged out to sea by undertow

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<sup>28</sup> "The Royal Benevolence Wiped Away Tears." By Onanan Woothisen. Translated by Suleeporn Bunbongkarn. *The Chaipattana Foundation Journal*, August 2005, pp. 31-33.

<sup>29</sup> "The Royal Benevolence Wiped Away Tears." By Onanan Woothisen. Translated by Suleeporn Bunbongkarn. *The Chaipattana Foundation Journal*, August 2005, p. 31.

<sup>30</sup> *Tsunami Phuket*, pp. 42+44+46.





suction and slammed onto the coral reefs.<sup>31</sup>

In the aftermath of the tsunami, environmental sanitation on Phuket Island had alarmingly deteriorated. In the Patong and Karon coastal areas the drainage systems were blocked by sand, and there was some damage to the wastewater treatment facilities. This caused the pollution of coastal waters and marine resources, with wastewater from the built-up beach front being emptied into the sea. This problem was aggravated by garbage, rubbish, rubble, debris and detritus tossed up by the giant waves and swept across the disaster area. What had not been sucked out into the sea, littered the land area. Beaches were, then, swamped with garbage dumped by regular waves, soon after the disaster. In Phuket, the debris from buildings, battered cars, and wrecked boats amounted to more than ten thousand cubic metres of waste.<sup>32</sup>

Other damages which the earthquake and tidal waves might have caused are subsidence and destabilization of natural

rock structures. Geophysical forces are assumed to cause landslides and land subsidence, as well as changes of the shoreline and coastland, water wells, artesian wells, coastal water and deep-sea bed levels, and ocean water channels.<sup>33</sup>

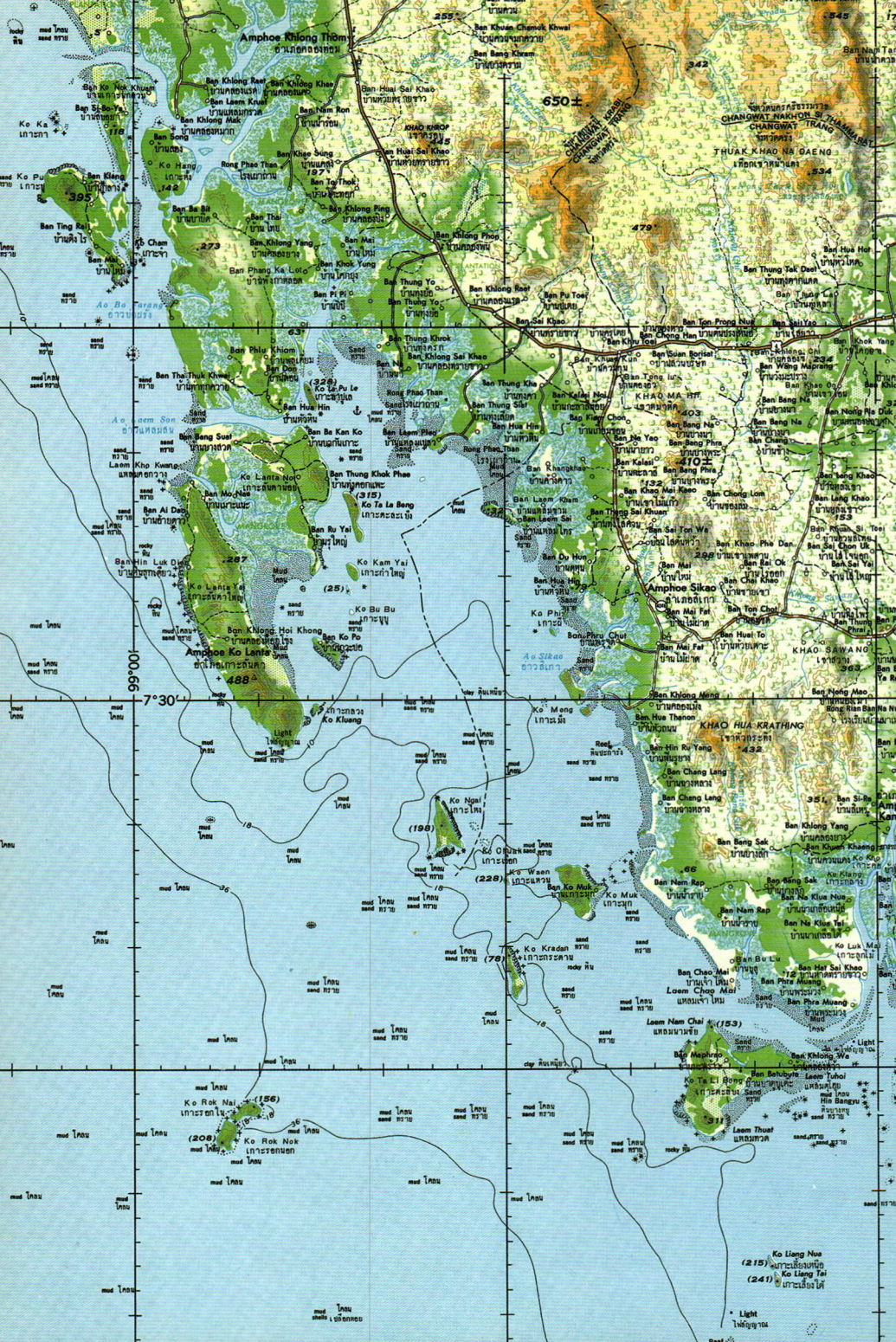
The report on damages to the natural environment in the area of Phang-nga Province, including its vast marine area with two major archipelagos and numerous islands, contains information on coral reefs. A team of experts from the Ministry of Natural Resources and Environment and Kasetsart, Burapa, Chulalongkorn, Mahidol, Ramkhamhaeng, Prince of Songkla, Walailak and Ratchamangkala universities assessed the tsunami's environmental impact. The findings indicated that the ten surveyed coral reefs of the Phang-nga National Marine Park had sustained some damages. To allow for recovery, they should remain free of any interference. Explicitly identified were the coral reefs near the Phakkat Bay of the Surin Archipelago, Southern Surin Island, western and eastern shores of Torinla Island, Miang Island in the Similan Archipelago, the northern seamount called 'Stonehenge', the southeastern surrounding of Payu Island, the 'Orchid Rocks', and the seamount of Hin Na Ling, also called 'Beacon Point'.<sup>34</sup>

<sup>31</sup> Tsunami Phuket, pp. 42+44+46.

<sup>32</sup> Tsunami Phuket, pp. 42+44+46.

<sup>33</sup> Tsunami Phuket, pp. 42+44+46.

<sup>34</sup> Phang-nga Tsunami, pp. 47-48.



A survey of the coastal waters of Phang-nga Province conducted by the Department of Marine and Coastal Resources resulted in the following findings. Of the mangrove swamp, spots totalling 304 hectares had been ruined. Damages to seaweed slightly exceeded 20 percent of the entire sea-grass bed. Damage was worst in the area of Thung Nang Dam on Phra Thong Island, Khura Buri District, caused by sediment whirled up from the sea channel. The calamitous tidal wave had also washed sea cows or manatee (named *phayun* in Thai and *dugong* in Malay) and dolphins, both protected species under threat of extinction, onto high and dry ground. Fortunately, efforts to save some of those animals were successful, and they were carried back to the sea, in time for them to survive.<sup>35</sup>



### Destruction and Damage of the Built Environment

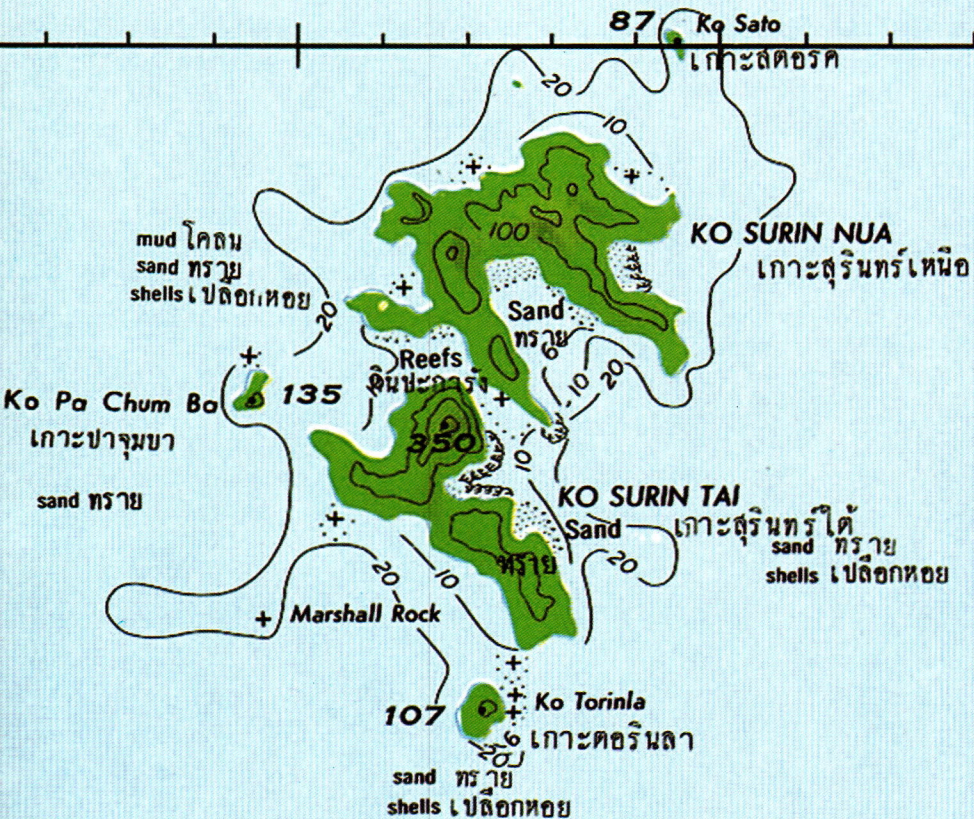
Highly visible were, at once, the destruction and damage wrought upon the peninsular coast of the Andaman Sea and its islands within the territories of Thailand's six southwestern provinces. Buildings of all kinds had been destroyed or damaged under the impact of the tsunami. Where it struck, houses of the customary type, built largely of wood, and those built of prefabricated elements were virtually destroyed, leaving thousands of people homeless. Likewise affected were schools, monasteries, mosques, and public service points. A great many of the characteristic bungalows, rustic restaurants, shops, and entertainment spots catering to holiday-makers were ravaged. Also, many buildings constructed using modern technology and materials did not withstand the force of giant waves. Damage and destruction of infrastructure worsened conditions in the aftermath of the disaster impact. This had the adverse effect of aggravating rescue operations and complicated the implementation of relief measures.

In Ranong Province, the tsunami hit Hat Praphat in Suksamran District to the effect that about forty houses were destroyed, at once. The National Highway No. 4, leading to Phang-nga and Phuket, was flooded and impassable in the province's Kapoe District. In the villages of Thale Nok, Thap Nuea, Laem Nao and Kampuan of Kampuan Sub-district, Suksamran District, many people died and many more lost their possessions.<sup>36</sup>

<sup>35</sup> Phang-nga Tsunami, pp. 47-48.

<sup>36</sup> Tsunami Phuket, p. 30.

sand  
mud  
shells



mud โคลน  
sand ทราย  
shells เปลือกหอย



The tsunami with giant waves that were ten to fifteen metres high ruined many coastal spots in Phang-nga Province, particularly beaches with tourism resorts, along a 120-kilometre strip in the districts of Khura Buri, Takua Pa, Thai Mueang, Takua Thung and Ko Yao. Houses, cars, motorbikes, trucks and boats were destroyed by the wave.<sup>37</sup>

The record of ruined housing units listed 2,696, of which 2,092 were destroyed and 604 severely damaged. Furthermore, the buildings of five schools were devastated. Those at Ban Bang Sak, Takua Pa District, at Ban Thap Lamu, Thai Mueang District, and at Ban Pak Chok, Khura Buri District, were completely destroyed. The buildings of the schools at Ban Nam Khem, Takua Pa District, and at Ban Thung Dap, a branch of Kiatpracha School, Khura Buri District, were severely damaged.<sup>38</sup> In Takua Pa District alone, where the area laid to waste measured 105.79 square kilometres<sup>39</sup>, 1,021 students were left without school buildings. Six households had their homestead razed to the ground. The homesteads of another eight households were in ruins. The physical property, other than houses, of seven households was destroyed.<sup>40</sup>

The number of fishing boats either destroyed or lost totalled 2,627, including trawlers (14%) and dories (86%). The

aquaculture facilities destroyed or damaged numbered 2,762.<sup>41</sup>

The giant waves destroyed or damaged hotels and shops at the beaches of Khao Pilai, Bo Dan, Hat Thai Mueang, Thap Lamu, Khao Lak, Bang Sak, Bang Niang, Laem Pakarang, Hat Nang Thong, Ban Nam Khem, Ko Kho Khao, and Ko Phra Thong, to name some of about fifty affected places, in all.<sup>42</sup>

The tourism and hospitality industry in Phang-nga Province sustained a worse impact than the other provinces on the Andaman Sea Coast. Especially at Khao Lak of Takua Pa District, an up-and-coming international tourist destination, all types of accommodation were devastated, including hotel buildings, bungalow-style resorts, hostel-type structures, and guest-houses, as well as restaurants, boutiques, food-stalls, and assorted shops. A first survey conducted immediately after the disaster had struck listed 93 hospitality enterprises as destroyed or damaged, with a total of 5,204 defunct rooms and suites, down from the pre-disaster total of 6,000 units, i.e. a loss equal to 87 percent.<sup>43</sup>

The booming tourism and hospitality industry in Phang-nga Province required as well as entailed a concentration of enterprises in the construction and related sectors. As many as 989 such business enterprises were affected by the tsunami, and 170 of them destroyed.<sup>44</sup>

Approximately one hour after the earthquake off the coast of Sumatra, the Andaman Sea receded rapidly by more

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<sup>37</sup> Tsunami Phuket, p. 30

<sup>38</sup> Phang-nga Tsunami, p. 33.

<sup>39</sup> Phang-nga Tsunami, p. 5.

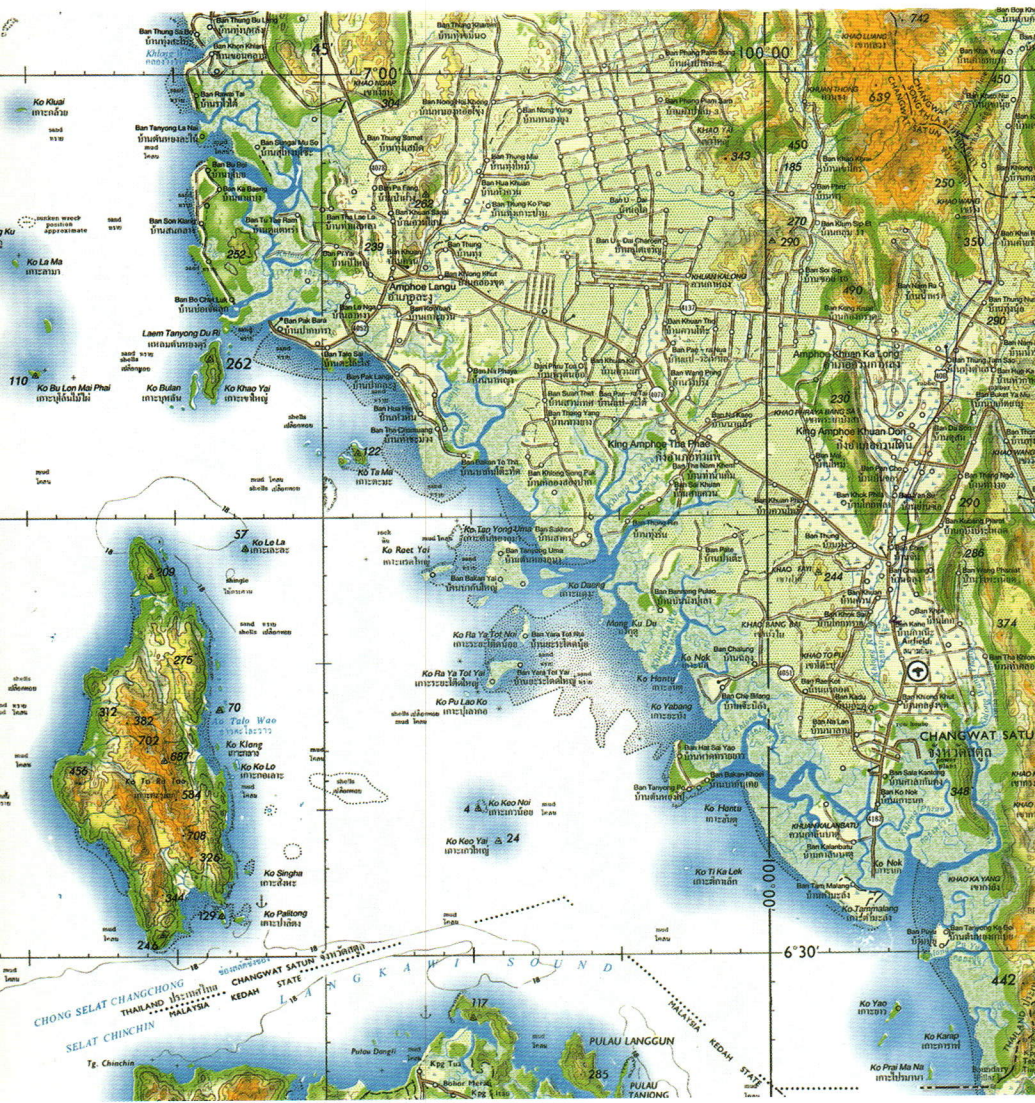
<sup>40</sup> Phang-nga Tsunami, p. 33.

<sup>41</sup> Phang-nga Tsunami, p. 6.

<sup>42</sup> Phang-nga Tsunami, p. 30.

<sup>43</sup> Phang-nga Tsunami, p. 6.

<sup>44</sup> Phang-nga Tsunami, p. 41.



than one hundred metres from the coast of Phuket Island. It, then, suddenly rose and lashed many beaches such as Surin, Kamala, Patong, Karon, Kata and Rawai with giant waves, between five and seven metres high. Also affected were the eastern bay of Ao Chalong and Sire Island.<sup>45</sup>

Shops, hotels, and various types of accommodation buildings in those areas were destroyed. The waves tossed the debris of buildings and cars across roads and beaches. On the east coast of Phuket Island, the Ratsada and Khlong Tha Chin piers as well as other fish landings were badly affected. More than one hundred fishing boats and tourist boats sank, some of them were thrown up onto beaches. The mobile phone network was overloaded and shut down. Phuket International Airport cancelled all flights.<sup>46</sup>

In Phuket Province 916 housing units were devastated, with more than one-third of these (366) totally destroyed.<sup>47</sup> Among the worst affected coastal settlements were Nong Nam Phru Yao and Nong Phru Thung Tian, Mai Khao Sub-district, Thalang District and Nong Han, Karon Sub-district, Mueang District.<sup>48</sup> Phuket Province was the second-worst affected of the six provinces, with some 13,065 people displaced constituting 2,613 households.<sup>49</sup>

Other buildings damaged or destroyed included 20 Buddhist monasteries, three mosques, four Muslim cemeteries, and the buildings of four schools.<sup>50</sup>

In the marine territory of Krabi Province, a giant wave as high as a three-storey building smashed into Phi Phi Don Island forcing people to flee by running up onto nearby hills. Ferries leaving Phi Phi Don Island for the peninsular coast of Krabi Province sank, leaving about one hundred persons out at sea. Long-tail boats, ferries, and yachts moored at the Phi Phi Don Pier were destroyed. On the mainland, a ten-metre wave rushed into the bay of Ao Nang, destroying shops and stalls near its beaches. Other tourist locations that were affected by the tsunami include Poda Island, Lanta Island, Ao Nang, Ao Railay (Raile), and Khlong Muang Beach.<sup>51</sup>

Giant waves as high as five to seven metres flooded the coasts of the districts of Kantang, Sikao, Palian and Hat Samran in Trang Province. Houses and resort buildings within a distance of fifty metres from the shoreline were destroyed. Some fishing boats sank.<sup>52</sup>



<sup>45</sup> Tsunami Phuket, p. 34.

<sup>46</sup> Tsunami Phuket, p. 29.

<sup>47</sup> Tsunami Phuket, p. 34.

<sup>48</sup> Tsunami Phuket, p. 30.

<sup>49</sup> Tsunami Phuket, p. 34.

<sup>50</sup> Tsunami Phuket, pp. 29-30.

<sup>51</sup> Tsunami Phuket, p. 30.

<sup>52</sup> Tsunami Phuket, p. 31.

Storms and high winds at sea were reported in the area of Pak Bara, Paknam Sub-district, and in Laem Son Sub-district of La-ngu District in Satun Province. There was damage to small fishing boats at Lipe and Lulon islands as well as at Pak Bara in Paknam Sub-district. There and in La-ngu District, houses and agricultural areas, especially watermelon farms located near the shoreline, were devastated. More than one hundred fishing boats and hinged, floating cages used in coastal-water aquaculture were destroyed.<sup>53</sup>

### Economic Losses

The material damage suffered by the population-at-large is reflected in financial terms, albeit tentatively and without taking into account a great variety of intangibles of value to survivors such as intangible assets and intangible properties. Examples are shattered careers and lost opportunities. First valuations made identify losses to field, tree and plantation cropping (8,496,214 baht, equivalent to US\$ 212,000 (US\$1.00@baht40.00) or EURO170,000 (€1.00@baht50.00), fishery (1,757,453,403 baht, equivalent to US\$44 million or €35 million, livestock production (17,625,605 baht, equivalent to US\$ 440,000 or €350,000, and other business enterprises (12,852,617,712 baht, equivalent to US\$320 million or €257 million. Total damage throughout the six provinces was estimated as amounting to 14,636.19



million baht, equivalent to US\$3.7 billion or EURO €2.9 billion.<sup>54</sup>

A first, rough cost estimate of the damage caused by the tsunami to public utility structures, facilities, services and systems such as piers, bridges, roads, drains, dikes, dams, electricity grid, water supply, and telecommunication network within the six provinces comes to 1,060.7 million baht, which is approximately equivalent to US\$26 million or EURO21 million. Tentatively specified were the costs of damages caused to the administrative infrastructure (326,723,280 baht), electricity generation and distribution system (29,354,684 baht), water supply system (12,664,544 baht) and telephone system (8,621,875 baht).<sup>55</sup>

According to an estimate by Thailand's National Economic and Social Development Board (NESDB), the worst affected sector of the regional and, hence, national economy was the tourism and hospitality industry. Thailand was assumed to lose approximately 30,000 million baht (approximately equivalent to US\$ 750 million or €600 million) in revenue solely upon cancellations of holiday bookings. This would decrease Thailand's

<sup>53</sup> Tsunami Phuket, pp. 30-31.

<sup>54</sup> Tsunami Phuket, p. 39.

<sup>55</sup> Tsunami Phuket, pp. 42+46.

Gross National Product (GNP) by approximately 0.3%.<sup>56</sup>

An assessment by the Tourism Authority of Thailand (TAT) of the impact on the tourism and hospitality industry for the first quarter of the year 2005 resulted in an estimated decrease in the number of foreign visitors to Thailand by approximately five (5) million visitors, which would cause a loss of income amounting to approximately 43,000 million baht (equivalent to US\$1,075 million or €860 million). Assuming that the industry might not have fully recovered within the second quarter of the year 2005, losses would reach approximately 52,400 million baht (equivalent to US\$1,310 million or €1,050 million). The severity of the disaster becomes obvious in the light of the fact that the tourism and hospitality industry of Thailand's Andaman Sea coast and islands, especially in the provinces of Phuket, Phang-nga and Krabi, had generated income in the order of approximately 400,000 million baht (equivalent to US\$10 billion or €8 billion), or one quarter of the national earnings from the tourism and hospitality industry, prior to the tsunami impact.<sup>57</sup>

The detailed documentation of economic losses sustained in Phang-nga Province sheds light on the extent and magnitude of the quantifiable destruction, devastation and damage wrought onto its coastal areas.

Phang-nga Province had sustained the gravest damage in terms of destroyed or damaged public utilities such as piers, bridges, roads, drains, dikes, dams, electricity grid, water supply, and telecommunication network, amounting to an estimated cost of approximately 400 million baht (equivalent to US\$10 million or €8 million).<sup>58</sup> Much of the housing stock (2,092 units) along the coast of the province was ruined.<sup>59</sup>

The damage wrought on agricultural lands, particularly on plantations, was assessed as amounting to 2,458.36 million baht (equivalent to US\$60 million or €50 million). Livestock lost was valued at 13,636 million baht (equivalent to US\$340,000 or €270,000 million).<sup>60</sup> By districts, damages to agricultural lands were greatest, by the cropping area, and valued as highest, in monetary terms, in Khura Buri District (647.28 hectares valued at 31,511,482.50 baht [equivalent to US\$790,000 or €630,000]), followed by Takua Pa District (250.2 hectares valued at 15,433,605.95 baht [equivalent to US\$385,000 or €308,000]), Thai Mueang District (33.92 hectares valued at 1,851,177.75 baht [equivalent to US\$46,000 or €37,000]), Takua Thung District (20.16 hectares valued at 1,640,200 baht [equivalent to US\$41,000 or €33,000]), and Ko Yao District (5.28 hectares valued at 68,739 baht [equivalent to US\$1,700 or €1,375]). In total, 956.84 hectares of agricultural land were ruined, whose valuation amounts to 50,505,205 baht (equivalent to US\$1.26 million or €1.01 million).<sup>61</sup>

Throughout the coastal areas of Phang-nga Province, 6,493 members of

<sup>56</sup> Tsunami Phuket, p. 37.

<sup>57</sup> Tsunami Phuket, p. 37.

<sup>58</sup> Tsunami Phuket, p. 42.

<sup>59</sup> Phang-nga Tsunami, p. 6.

<sup>60</sup> Phang-nga Tsunami, p. 6.

<sup>61</sup> Phang-nga Tsunami, p. 16.

fishing communities reported material losses valued at a total 1,088,387,145 baht (equivalent to US\$27 million or €22 million).<sup>62</sup> Especially two major ports of Phang-nga Province, Ban Thap Lamu in Lam Kaen Sub-district of Thai Mueang District and Ban Nam Khem in Bang Muang Sub-district of Takua Pa District were severely damaged. The giant waves devastated buildings and destroyed fishing boats and gear.<sup>63</sup>

Coastal marshes with mangrove trees, the breeding and hatching grounds for aquatic life and, hence, of vital importance to fishery and seafood supply, were ruined to a great extent. Overall, 304 hectares of this precious natural habitat were devastated. The valuation based on survey findings figured the loss at 224,827,000 baht (equivalent to US\$5.6 million or €4.5 million).<sup>64</sup>

Like the large-scale devastation wrought on the physical environment and its natural resources along its peninsular coast, the tourism and hospitality industry on the shoreline of Phang-nga Province was hit more severely than any of the other five provinces facing the Andaman Sea. The 93 tourist accommodation structures with 5,204 rooms and the 857 related service structures that were damaged or destroyed by the tsunami were valued having been worth a total of

6,727.9 million baht (equivalent to US\$168 million or €135 million). The brunt of the tsunami onslaught was borne by the resort of Khao Lak in Khuek Khak Sub-district of Takua Pa District.<sup>65</sup>

Facing sudden unemployment, a fraction of the surviving labour force in Phang-nga Province was entitled to severance pay. Altogether 2,094 persons out of employment received their entitlement totalling 38.36 million baht (equivalent to US\$960,000 or €767,000). As stipulated by Thailand's Labour Law, 2,678 former employees were covered by social security, at a total expense of 274.28 million baht (equivalent to US\$6.9 million or €5.5 million).<sup>66</sup>

The valuation of losses in Phuket Province was documented as follows. The by far biggest proportion (90.81%) accounted for business enterprises in the industry and service sectors (3,954,082,932 baht [equivalent to US\$100 million or €80 million]). Minor proportions were figured for fisheries (344,911,169 baht [equivalent to US\$8.6 million or €6.9 million]), livestock production (303,650 baht [equivalent to US\$7,600 or €6,100]) and cropping enterprises (300,000 baht [equivalent to US\$7,500 or €6,000]).<sup>67</sup> Religious edifices valued worth a total of 24,790,000 baht (equivalent to US\$620,000 or €495,000) sustained damage or destruction. The cost estimate of damages to school buildings amounted to a total of 30,000,000 baht (equivalent to US\$750,000 or €600,000).<sup>68</sup>

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<sup>62</sup> Phang-nga Tsunami, p. 27.

<sup>63</sup> Phang-nga Tsunami, p. 24.

<sup>64</sup> Phang-nga Tsunami, pp. 47-48.

<sup>65</sup> Phang-nga Tsunami, p. 6.

<sup>66</sup> Phang-nga Tsunami, p. 42.

<sup>67</sup> Tsunami Phuket, pp. 37+39.

<sup>68</sup> Tsunami Phuket, pp. 29-30.

## RESCUE

Facing the enormous challenge of an unprecedented emergency, rescue operations were started at once. People who witnessed how the disaster took its course, from safe places near the disaster areas, both locals and holiday-makers including Thai and foreigners, were the first to rush to the rescue of those in danger. Many victims owe their survival to those courageous saviors. Driven by the urge to wrest lives from the grip of death, many individuals performed heroic deeds. Sadly some of those unsung heroes perished while rescuing victims. This spontaneous and compassionate helpfulness marks the start-up of larger-scale search and rescue operations.



Their Majesties and the Royal Family advised that assistance be rendered with the greatest urgency. In Phang-nga Province, ten emergency assistance centres were set up in cooperation between the provincial administration and volunteer groups, and supported by the Rajaprajanugroh Foundation under Royal Patronage, the Thai Red Cross Society under Royal Patronage, the Phuean Phueng (Pha) Yam Yak Foundation under Royal Patronage, as well as many other agencies and charity organizations from all over the country. Immediate help rendered to survivors among the disaster victims comprised the supply of drinking water, food stuff and daily basic necessities, as well as temporary shelter.<sup>69</sup>

## ROYAL THAI GOVERNMENT INTERVENTION

The Government gave the policy directive setting highest priority for search and rescue as well as assisting victims, rather than consider loss of property or damages. Survivors were guided or carried, as the needs dictated, to safe places, given first aid and, if seriously injured, transported to hospitals.<sup>70</sup>

Within two days, i.e. 26 and 27 December 2004, the Phuket Provincial Office had arranged for surviving victims to be transported out of most disaster areas. Rescue teams from welfare foundations and volunteer organizations gave their support by sharing duties and responsibilities in helping disaster victims. Seriously injured victims were evacuated by helicopter; other victims were transported by emergency ambulances and suitable cars, receiving first aid treatment on the way.<sup>71</sup> The Narenthon Andaman Call Centre operated an emergency service out of Wachira Phuket Hospital to help foreigners and arrange the transport of injured victims for treatment at hospitals.<sup>72</sup>

To save the lives of severely injured disaster victims, first aid was administered while rushing them to the closest medical facility for start-up treatment. This procedure was facilitated by dedicated staff and volunteers in charge of transferring badly injured victims by land, sea, and air. Particularly challenging was the rescue of seriously injured victims on remote islands or in mudflats. In as far as available, elephants, horses,



<sup>69</sup> Phang-nga Tsunami, p. 13.

<sup>70</sup> Tsunami Phuket, p. 49

<sup>71</sup> Tsunami Phuket, p.50.

<sup>72</sup> Tsunami Phuket, p.51.



cattle and buffalos replaced vehicles for use in such taxing terrain. Private-sector enterprises mobilized boats and helicopters to support the government's efforts to gear up emergency intervention. Examples include the cruise vessel named "Andaman Princess", Thai Oil Co., Ltd. providing petrol free-of-charge, and both UNOCAL and PTT Exploration and Production Plc deploying helicopters to search for disaster victims.<sup>73</sup>

Both staff of government agencies and private-sector volunteers helped search for survivors and collect corpses in the coastal area of Phuket Island. The Commander-in-chief of Army Region 3 dispatched soldiers who joined police officers, provincial and local administration officers, staff of foundations, and volunteers to comb the shore for survivors. Such teams rescued survivors trapped under the debris of ruined buildings, in mangrove forests, out at sea, and in other potentially dangerous locations such as in pits of former tin mines. Diving companies located at Patong Beach joined the effort to find and extract corpses from the basement of the inundated Ocean Plaza supermarket. The Royal Thai Police also sent divers to support that mission. Most corpses floating in the sea were retrieved by the Royal Thai Navy.<sup>74</sup> Support in search and rescue was rendered by Japan's National Defence Force which provided three vessels equipped for rescue operations. Germany, France, Taiwan, Hong Kong, Italy, the United



States, South Korea, and numerous other countries also sent rescue teams of more than four hundred experts who brought along rescue gear, tracker dogs, and search equipment.<sup>75</sup>

Another important task was the search for and the registration of missing persons. A centre was set up to register persons reported missing and to update lists of missing persons found alive or dead. Volunteers helped in this task as interpreters and translators. The centre's registers of missing people compiled at the Provincial Halls of Phuket, Krabi, Ranong, Phang-nga, Trang and Satun, as well as each and every district office in the disaster zone, were shared to exchange information and coordinate follow-up actions on missing people with the help of hospitals. Relatives of missing persons who were in Bangkok could contact the Residential Registration Office of the Department of Provincial Administration, Ministry of Interior. The search for missing persons was coupled with a DNA identification service.<sup>76</sup>

Many disaster victims including tourists received first aid and, if necessary, were transferred for treatment to six state or private hospitals in Phuket, namely, Wachira Phuket, Patong, Thalang Mission, Bangkok Phuket, Sirirod and

<sup>73</sup> Tsunami Phuket, p. 52-53.

<sup>74</sup> Tsunami Phuket, p. 53.

<sup>75</sup> Tsunami Phuket, p. 53.

<sup>76</sup> Tsunami Phuket, pp. 53-54.



## Tsunami Disaster Victim Logistics Center

In a meeting convened with the cabinet ministers and concerned government officials at the Southern Tsunami Disaster Victim Logistics Center, the Government gave orders, as follows :

1. The Royal Thai Army, Region 4, to provide a satellite communication truck to support communication in the Phuket area.

2. To mobilize a force of officers and volunteers to organize search parties in the Khao Lak area, Takua Pa District, Phang-nga Province.

3. Phuket and other disaster-prone provinces to be equipped with installations to convey warning calls to residents within three hundred metres from the coastline so as to safeguard against after-shock damage.

4. The Department of Disaster Prevention and Mitigation to coordinate with the Po Tek Tueng Foundation and other rescue volunteers to find survivors and corpses in the Khao Lak area, Takua Pa District, Phang-nga Province, in the morning of 27 December 2004. Transportation to be provided by the Royal Thai Air Force deploying a C-130 aircraft.

5. A Royal Thai Navy cruiser to be deployed to search for and rescue disaster victims, and helicopters to be used for delivery of food and drinking water, as well as transfer of injured survivors.

6. Allocation areas defined for ministries to assume responsibility for direct intervention so as to solve problems expeditiously.

Phuket Ruam Phaet. The government undertook to defray all expenses. In total, the said hospitals treated approximately 1,500 patients within the first three days.<sup>77</sup>

Moving the injured victims from the disaster area was a completely separate activity, and first aid to the victims was a priority to ensure the victims' survival. Doctors experienced in emergency medical practice carried out this task, along with local rescue teams. The disaster victims were separated into four groups: patients with minor injuries, medium-level injuries, seriously injured patients, and the deceased. First aid was always prioritized to the seriously injured patients by ensuring that the medical staff were working as meticulous and fast as possible. In coping with the challenges posed by a disaster of such unprecedented magnitude and complexity, many foreign tourists volunteered as interpreters and translators, as well as in numerous other support activities, and thus performed essential roles as coordinators and operatives.<sup>78</sup>

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<sup>77</sup> Tsunami Phuket, pp. 54-55.

<sup>78</sup> Tsunami Phuket, pp. 54-55.

Phuket, Phang-nga, Krabi, Trang, Satun and Ranong provinces were declared emergency disaster areas, and the “Assistance Centre for Victims of the Earthquake and Andaman Coastline Tidal Wave” was set up at Phuket Provincial Hall.<sup>79</sup>

The Marine Department, Ministry of Transport, provided 15 boats, and vessels were also obtained from the private sector to transport victims in the maritime territory of Phang-nga Province. Aboard each rescue boat were medical doctors and nurses.<sup>80</sup>

The Ministry of Public Health set up three centres, one each at Wachira Phuket Hospital, Krabi Hospital and Phang-nga Hospital, to treat the injured and drowned. In addition, a “war room” was set up for coordination and planning. Teams of doctors from outside and volunteers joined in these efforts, all in all 1,127 persons. Through a volunteer register the tracking of volunteers with specialized capabilities was ensured.<sup>81</sup>

The Department of Disaster Prevention and Mitigation ordered inflatable boats, engines, and rescue vehicles as well as equipment from Region 4 Prachuap Khiri Khan Province, Region 11 Surat Thani Province and Region 12 Songkhla Province. The Department also requested the active involvement of personnel from other government agencies, soldiers, police officers, members of charity

foundations, and staff of provincial sections. To this effect, the Royal Thai Army, the Royal Thai Navy, the Royal Thai Air Force, the Royal Thai Police, the Rajaprajanugroh Foundation under Royal Patronage, the Thai Red Cross Society under Royal Patronage, the Phuean Phueng (Pha) Yam Yak Foundation under Royal Patronage, and private foundations were alerted to the horrendous devastation; all of them sent staff and material for immediate help to disaster victims.<sup>82</sup>

The Ministry of Foreign Affairs set up a 24-hour Coordinating Centre, on 26 December 2004 at approximately 16.00 hrs., at its seat in Bangkok to assist foreign nationals affected by the tsunami disaster. Later that same day, a special flight was arranged to take Foreign Ministry officials and representatives of the diplomatic missions based in Bangkok to Phuket Island, to provide immediate assistance to foreign nationals among the victims. The Ministry of Foreign Affairs assessed the type of assistance required after consulting with concerned agencies, and coordinated with other governments to request technical assistance, including search and rescue experts, forensic and medical experts, medical supplies, among other necessities. At the same time, Thai missions overseas were assigned as focal points to receive donations from concerned peoples and charity organizations abroad. The Ministry of Foreign Affairs helped to coordinate with respective diplomatic missions to compile DNA profiles of the victims to be used in the identification process. Through coordination with respective diplomatic missions and

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<sup>79</sup> *Tsunami Phuket*, pp. 72+74.

<sup>80</sup> *Tsunami Phuket*, p. 50.

<sup>81</sup> *Tsunami Phuket*, p. 55.

<sup>82</sup> *Tsunami Phuket*, pp. 49-50.

concerned agencies, victims' identified bodies were expedited to the respective countries.<sup>83</sup>

### Rescue Operations by the Royal Thai Armed Forces

Upon the devastating natural disaster on the coast and islands of the Andaman Sea within six southern provinces, on 26 December 2004, the Supreme Commander, as the Director for Disaster Relief Operations, Ministry of Defence (MOD), following an MOD Order No. 70/40 dated 25 March 1997, commanded each Armed Forces' Centre for Disaster Relief (CDR) Operations and the CDR of the Armed Forces Development Command (AFDC) to carry out a survey of the damages and provide assistance.

In order to facilitate rescuing efforts, CDR-MOD established a Disaster Relief Centre, MOD, and dispatched a CDR-MOD Forward Detachment on 27 December 2004 at the 3<sup>rd</sup> Naval Area Command, Royal Thai Fleet, Phuket Province. There were a total of 7,832 men from the CDR-RTA Forward Detachment, CDR-RTN Forward Detachment, CDR-RTAF Forward Detachment, and CDR-AFDC Forward Detachment, participating in the force.

The concept for the operations distinguished six stages :

- 1<sup>st</sup> stage : urgent assistance;
- 2<sup>nd</sup> stage : medium-term assistance;
- 3<sup>rd</sup> stage : long-term assistance;

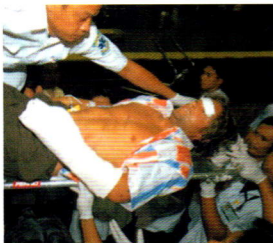
- 4<sup>th</sup> stage : establishment of the tsunami early warning system;
- 5<sup>th</sup> stage : program to revitalize tsunami victims' morale;
- 6<sup>th</sup> stage : arrangement of the "Preserve the Andaman Day".

At the 1<sup>st</sup> stage, urgent assistance for affected persons was delivered. Main responsibilities included the dispatching of a search-and-rescue team, evacuation and transportation of victims, corpse retrieval, formation of medical mobile teams drawn from various hospitals and distribution of emergency food rations. The commissioning of engineering equipment opened the stretch of the national highway between the Khao Lak area and Bang Muang Sub-district in Phang-nga Province. The Royal Thai Navy arranged a naval force of barges and amphibious vehicles to assist victims. The Royal Thai Air Force formed medical teams specialized in performing surgery. In addition, aerial surveillance was conducted to take photographs of the devastated ground, which were added to a database geared to search for missing people.

By division of responsibility zones, the CDR-RTA Forward Detachment was responsible for ground areas, except for Ranong Province; the CDR-RTN Forward Detachment was responsible for naval operations along with covering certain islands; the CDR-RTAF Forward Detachment was responsible for Ranong

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<sup>83</sup> Summary of the Measures Implemented by the Ministry of Foreign Affairs of Thailand in the Aftermath of the Tsunami Devastation. Bangkok: Ministry of Foreign Affairs, (2005), items # 1, 2, 6 & 7.



Province; and the CDR-AFDC Forward Detachment was responsible for the ground and naval areas assigned earlier.

The results of those operations geared to rescue survivors and retrieve corpses were summarized as follows: the CDR-RTA Forward Detachment had assisted 1,200 injured civilian survivors and retrieved 769 corpses; the CDR-RTN Forward Detachment had assisted 773 civilian survivors, transported 1,183 lives from various islands, helped 30 seriously injured lives through transfer by RTN helicopters, retrieved 209 corpses from the ocean, and transported 202 corpses from Phi Phi Island onto the peninsular shore.<sup>84</sup>

The Royal Thai Navy and the flight section of the police and marine police helped transport disaster victims from various islands to major hospitals. H.T.M.S. Phuket and H.T.M.S. Rin carried disaster victims from the Khao Na Yak area in Phang-nga Province. H.T.M.S. Wang Nai and two helicopters standing by in Phuket and Songkhla were sent to help disaster victims on Phi Phi Don Island. H.T.M.S. Wang Nok carried

disaster victims from the Similan Archipelago. H.T.M.S. Longlom fetched disaster victims from the Surin Archipelago. A Dornier search plane and ten helicopters combed the coastlines for survivors. Rescue operations were joined by the Royal Thai Navy's ships 'Chakrinareubet' and 'Naresuan', with four helicopters on board, from the Chuk Samet Naval Base, Sattahip.<sup>85</sup>

Some patients were transported by a C-130 aircraft of the Royal Thai Air Force, rescuing 1,044 injured victims through providing 14 flights. There were teams of medical doctors from the Bhumibol Hospital in Bangkok who treated foreign patients while waiting for their airlift back home. The Royal Thai Air Force also sent one hundred officers to the disaster areas to help victims.<sup>86</sup>



<sup>84</sup> "Defence. Missions and Roles of the Royal Thai Armed Forces". Draft papers. Thailand in the 2000's, (in preparation) Bangkok, (2005). First version, pp. 8-11 / Enlarged version, pp. 12-15.

<sup>85</sup> Tsunami Phuket, p. 51.

<sup>86</sup> Tsunami Phuket, p. 52.

## Rescue Operations by the Royal Thai Police

Provincial police operated in the disaster area, coordinating with other government agencies and private-sector organizations to help and search for disaster victims in the most effective manner possible, at that time.

Considering that this was a big disaster which caused a huge loss of human life and property, the Royal Thai Police set up a Disaster Victim Relief Center of the Provincial Police Region 8 at the Phuket Provincial Police Office, on 28 December 2004. The Provincial Police Administration Department provided control, direction, and coordination to help and support the relevant sections in their efforts to help disaster victims.

The police operations were focused on crime prevention, especially theft and looting of disaster-affected properties. Police also supported forces from the Security Volunteer Civil Section (Or.Por.Por. Ror.). Other responsibilities included safeguarding people against infections caused by decaying corpses and supporting the identification procedure by recording forensically relevant points.<sup>87</sup>

## Mental Health Rehabilitation for Disaster Victims

For surviving victims psycho-therapy has been essential. The Drug Addiction Prevention and Rehabilitation as well as



the Mental Health units of the Phuket Public Health Office, in cooperation with the Mental Health Department and the relevant sections of Siriraj Hospital, Ramathibodi Hospital, Samut Prakan Hospital, Chiang Mai University, Chulalongkorn University, Medical Science College of Phra Mongkut Klao Hospital and the Nurses College of the Royal Thai Army set up the Phuket Mental Health Care Centre for Tsunami Disaster Victims. Its task was to mobilize psychiatrists, psychologist teams, nurses, and social welfare officers to diagnose and administer mental therapy as well as offer advice to individuals and groups. As documented in the centre's report, half of the disaster victims seeking treatment were traumatized to the effect that they could not find any sleep.<sup>88</sup>

Psychologists tended to disaster victims by distinguishing between children and adults for specialized group therapy. Children obviously needed special care with some of the psychological problems manifest in bed-wetting and being scared of strangers or darkness. Some such children required short-term or long-term care. Activities were organized for children, and advice was

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<sup>87</sup> Tsunami Phuket, pp. 66-67.

<sup>88</sup> Tsunami Phuket, pp. 63+65.

conveyed to teachers, parents, and community leaders so as to foster a helpful attitude toward those children in their community. Child psychologists also coordinated with mental health sections of the United Nations Children's Education Fund (UNICEF) and the World Health Organization (WHO). To provide therapy for adult disaster victims, psychologists visited the disaster areas to seek out the local needs. Any disaster victims who were found to have mental problems were transferred to psychiatrists for treatment. A status report categorized half of the disaster victims as in need of medical treatment, while others required counseling and follow-up care.<sup>89</sup>

The report on medical care provided in Phang-nga Province highlights how assistance was mobilized in quick

succession. Within 24 hours upon disaster impact, the crisis management plan was activated, the communication network was completely operational, the emergency relief got into high gear at the scene of the tsunami impact, and the medical care system was engaged in treating patients at the service centres. Using the established coordination system, a component of the Disaster Preparedness Contingency Plan mentioned further below, appeals for aid had been sent to the eastern neighbouring provinces. Public health service resources were at hand to take care of survivors, treat the injured, and counsel relatives of the dead. All service networks, including an electronic searching system, were used to locate and rescue survivors, and to arrange transportation of the injured by land, air and sea.<sup>90</sup>



<sup>89</sup> Tsunami Phuket, pp. 63+65.  
<sup>90</sup> Phang-nga Tsunami, p. 53.

## Rescue Operations by the Phang-nga Provincial Administration

At the provincial administrative level, rescue operations were geared to meet the particular disaster situation. The Phang-nga Provincial Administration formed five teams with clearly defined responsibility areas, as follows:

1. The rescue-and-relief team was the mobile unit comprising rescue experts who were responsible to search for survivors in ruins, transfer victims to safer ground, and retrieve corpses.

2. The aid-to-victims team was responsible for delivering drinking water, food stuff, and consumer goods such as daily necessities, as well as allocating and transferring victims to temporary shelters.

3. The medical team was responsible for first aid to injured people and medical treatment of hospitalized patients.

4. The rehabilitation team was responsible for surveying damaged and destroyed structures, and in charge of planning the speedy rehabilitation of public utilities.

5. The security-and-negotiation team was made up of police officers and volunteers patrolling the disaster area, to ensure safety and security, direct road traffic, assist evacuation, remove corpses, and provide equipment required for post-mortem identification.<sup>91</sup>

The Fishery Research and Development Centre, established in Phuket

Province by the Department of Fisheries, set up a support unit to coordinate rescue, relief and rehabilitation in the Andaman Sea. That Centre gave high priority to helping the fishing communities in Phang-nga Province. In addition, Phang-nga Province established two support centres, one to assist fishermen and another to assist aquaculture entrepreneurs. The officers of units at central and provincial levels were mobilized, and 138 experts manned twelve vessels. They searched the seas around the archipelagos for survivors and retrieved victims' corpses. They also salvaged one sunken vessel.<sup>92</sup>

## Rescue Operations by the Phuket Provincial Administration

As ordered by the Government, the Governor of Phuket Province assumed the responsibility to coordinate crisis management. Phuket Province set up the Assistance Centre for Victims of the Tsunami Disaster (ACVTD) at Phuket Provincial Hall, on 26 December 2004, to direct relief for disaster victims within the three districts of Mueang, Kathu and Thalang, also to coordinate operations between government agencies and private-sector organizations as well as between their central-level and local-level units. The mission of the ACVTD was defined in terms of duties and responsibilities, as follows: units in charge of general coordination, assistance to disaster victims by search for survivors and rescue, assisting and transferring injured tourists, tourist transportation, arranging for treatment of injuries, corpse retrieval, security, disaster victim counselling, distribution of donated

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<sup>91</sup> Phang-nga Tsunami, pp. 9+11-12.

<sup>92</sup> Phang-nga Tsunami, p. 27.





money and goods, and liaison with other Phuket provincial offices responsible for recovery. Also involved were the Department of Local Administration to help people, the Public Relations Department to provide information, and a call centre for perusal by disaster victims.<sup>93</sup>

Hospitals had made provision through a “Disaster Preparedness Contingency Plan” drawn up previously for implementation in the event of an emergency. At Wachira Hospital the “Golden Dream” (“*Fan Si Thong*”) plan was implemented. Teams of doctors and nurses together with health-care staff were called together to take care of surviving victims. The hospitals were supported by private-sector enterprises, rescue squads, and volunteers. Foreigners initially helped by giving first aid, registering survivors, assisting to trace missing persons, and helping with processing paperwork for the issuing of temporary passports.<sup>94</sup>

The Phuket Public Health Department dispensed medicine provided by the Food and Drug Administration, the Defence Pharmaceutical Factory, the Thai Red Cross Society under Royal Patronage, the Phuket Pharmacists’ Club, the governments of Japan, Brazil, Israel, and Jordan, and the Chinese Embassy in Bangkok. From Phuket medicine was also rushed to Phang-nga Province where help was direly needed.<sup>95</sup>

The Phuket Provincial Public Relations Office released information, kept a register of missing and dead disaster victims, and found temporary accommodation for foreigners. The PR office operated with the support of foreign and Thai volunteers, coordinating with any unit needing volunteers, as well as giving advice to people who wanted to volunteer. The team also coordinated with the Phuket Journalists’ Club and provided Thai and foreign journalists with information, and assisted by making contacts for and with charity organizations, government agencies, private-sector business enterprises and individuals offering support.<sup>96</sup>

<sup>93</sup> *Tsunami Phuket*, p. 75.

<sup>94</sup> *Tsunami Phuket*, pp. 22-23.

<sup>95</sup> *Tsunami Phuket*, p. 55.

<sup>96</sup> *Tsunami Phuket*, pp. 75-76.

## Rescue Operations by Foundations

The Kusontham Foundation of Phuket rescued and transported disaster victims in the Patong area. Its staff transported more than 500 people to Patong Hospital for treatment. The foundation also dispatched several rescue teams to join police officers and hospital staff to help many injured survivors from other seaside disaster areas, including the beaches named Kamala, Bang Thao, Kata and Karon, as well as Cape Tukkae. As the crisis situation on Phuket Island eased, the Foundation also sent rescue teams to Phang-nga Province, where experts were needed to search for survivors and collect corpses.<sup>97</sup>

The Ruam Chai Ku Phai Foundation rescued people in the areas of Chalong, Kata, Karon, Rawai, and Nai Han. Its tsunami disaster rescue and relief centre was located in Chalong Sub-district of Mueang District. The Foundation dispatched staff and cars to transport injured victims to hospitals, as well as to collect and bag corpses. After the situation in Phuket improved, the Foundation sent staff to Khao Lak, the ravaged resort in Takua Pa District of Phang-nga Province.<sup>98</sup>

## Rescue Operations through Private-sector Initiative

Communication companies also offered help such as the Advanced

Info Service Plc. (AIS), Total Access Communication Plc., TA Orange Co., Ltd., True Corporation Plc., and TT&T Plc. They announced that people within the six provinces affected by the tsunami could temporarily use their service free-of-charge. TA Orange provided 20 free mobile phones within the provinces of Phuket and Krabi. CAT Telecom Plc. provided free international phone calls and gave CAT Thaicards to disaster victims. TT&T installed domestic and international phones. The TOT Corporation Plc. supplied instruments and equipment to install 50 telephone lines, providing free service for long-distance telephone connections, and installed telephones in all administration centres of disaster areas and at Mai Khao Cemetery, abolished the charging for long-distance telephone calls made at the Assistance Centre for Victims of the Tsunami Disaster, and installed a video conference point at Phuket's Provincial Hall for immediate access.<sup>99</sup>

## Forensic Services

The post-mortem examination of the extremely large number of corpses in the large territory of Phang-nga Province, encompassing the Similan and Surin archipelagos as well as numerous solitary islands and islets, was a most important and urgent task. It was performed in coordination with and under the supervision of the Institute of Forensic Science, Ministry of Justice. By contributing heavy equipment, tools, expertise and support personnel, several organizations worked together and channeled their findings through an information centre handling the cases of dead and missing victims.<sup>100</sup>

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<sup>97</sup> Tsunami Phuket, pp. 50-51.

<sup>98</sup> Tsunami Phuket, p. 51.

<sup>99</sup> Tsunami Phuket, pp. 83-84.

<sup>100</sup> Phang-nga Tsunami, p. 54.

Once corpses were found and retrieved, they were kept in three main mortuaries set up in the premises of monasteries, namely, Wat Lak Kaen, Thai Mueang District, as well as Wat Bang Muang and Wat Yan Yao, Takua Pa District, all located in Phang-nga Province. These sites served as centres for the collection, separation and identification of corpses by the Institute of Forensic Science, assisted by Thai medical doctors and with International Police officers standing by at the monastery of Wat Yan Yao and a team of medical doctors from Siriraj Hospital, Faculty of Medical Science, Mahidol University, Khon Kaen University and Srinakharinwirot University who were standing by at the monastery of Wat Bang Muang. There also was a team of medical doctors from the Royal Thai Police on a 24-hrs standby at the monastery of Wat Lak Kaen.<sup>101</sup>



The Disaster Victim Identification (DVI) unit was a team of specialists in forensic medicine, chemistry, dental medical science, and experts in operating the DNA processing. The DVI team of professional forensic scientists used standard protocols. The procedure of personal identification required a certain amount of personal information to conform to international standards, including fingerprints, DNA matches, and dental as well as medical records. In cases where this procedure did not result in identifying a body, clothes, jewellery or body-marks were photographed though this was not deemed a foolproof method, as bodies bearing similar marks or jewellery might be mixed up.<sup>102</sup>

Since 21 February 2005, members of the identification team were able to collect readable fingerprints from the corpses of more than 2,000 victims, thus performing fingerprint testing on almost 80% of the victims. For lack of fingerprint records, many others could not be identified, although fingerprints from their corpses had been collected. From the fingerprints of people reported missing only 21 percent could be matched



<sup>101</sup> Tsunami Phuket, pp. 23+60.

<sup>102</sup> Tsunami Phuket, pp. 60-61.

with the corpses which is recognized, indeed, as a rather high success rate.<sup>103</sup>

DNA matching obtained a high rate of success and was recognized to be a trustworthy method of identification. Because of the heat and the resultant acceleration of body decomposition, the rapid DNA processing technology is highly preferable in subtropical and tropical latitudes.<sup>104</sup>

The use of dental records, especially dental X-ray images, was another method employed to identify the dead. It was advised that any search for missing people on any websites or billboards should be accompanied by photographs depicting persons with a laughing or smiling face and their front teeth clearly visible.<sup>105</sup>

The post-mortem examination and corpse identification centre also coped with the challenge of ensuring environmental sanitation and hygiene. The sewage disposal required that painstaking precautions were taken. The effluents of the post-mortem examination, between 1,000 and 1,500 litres daily, were collected in septic tanks of 10,000-litre capacity. Two tanks had been provided for each of the three forensic practice sites. At intervals of four to five days, the collected sewage was transported to the sewage treatment facility of Takua Pa

Hospital. Containers for corpses were lined with plastic sheets and sawdust to absorb the liquid exuding from the corpses. This precaution reduced leaking. To safeguard against contamination of the immediate environment, fermenting bacteria were sprayed twice daily around the corpse containers.<sup>106</sup>

To keep corpses which were decomposed to a degree where physical identification seemed unfeasible, the installation of a separate morgue named Thai Tsunami Victim Identification (TTVI) unit was set up. It was the unit in charge of body identification using forensic science to meet standard requirements. Mai Khao Cemetery located in Mai Khao Sub-district, Thalang District of Phuket Province was chosen as the site for the collection of unidentified corpses retrieved in Phuket and Phang-nga provinces. Mai Khao Cemetery was maintained as the facility for further identification efforts where corpses yet to be identified were kept in special containers.<sup>107</sup> That cemetery was chosen for the convenience of transporting foreigners' corpses to Phuket International Airport and corpses of victims from neighbouring Phang-nga Province to their places of origin.

Permission for the release of corpses was conditional upon their identification. To receive a corpse at Mai Khao Cemetery, one had to seek approval by a sub-committee in charge of issuing the death certificate. The Australian government hired Kenyon Company which was responsible for procedure and transportation back home, at no expense to Thailand.<sup>108</sup>

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<sup>103</sup> Tsunami Phuket, p. 61.

<sup>104</sup> Tsunami Phuket, p. 61.

<sup>105</sup> Tsunami Phuket, p. 61.

<sup>106</sup> Phang-nga Tsunami, p. 57.

<sup>107</sup> Tsunami Phuket, p. 60.

<sup>108</sup> Tsunami Phuket, pp. 61-62.



From among the numerous instances of spontaneous and life-saving assistance generously rendered by local residents to disaster victims immediately upon the devastating tsunami impact, one account publicized internationally is presented as an example. Also, there were countless personal expressions of gratitude for such manifestations of helpfulness. In particular, survivors felt the desire to make it known how fortunate they had been, owing to the caring of Thai people. The essence of some survivors' sentiments is reflected in randomly selected examples.

Appreciation of Exemplary  
Assistance to Surviving Victims

Under the headline reading "Hotel Turned Into Tsunami Rescue Center", The Associated Press released a report, published by The New York Times, 20 January 2005. Its gist is presented hereunder.

When the tsunami had struck the famous beach resort of Khao Lak, the owner of the Khao Lak Nature Resort, situated on a hilltop, together with one of his sons drove down to and along the coast, where they picked up 200 stranded tourists on the roads, in devastated hotel compounds, and at hospitals, to give them food and shelter. The owner's wife and another son took care of those survivors, among them some 70 with injuries.

In the words of a volunteer from the United States, what enabled the owner to rally local support was the fact that he is

a community leader who enjoys the trust of his local fellow citizens. His relationship became apparent, in the first critical days, when a telephone company set up a call centre, operating free-of-charge, and an agribusiness enterprise donated food stuff.

Next, the owner of that hill top resort offered Thai and foreign rescue teams space to set up their base of operation, free-of-charge. Almost one month after the disaster had struck, about 150 local and foreign volunteers were still working in the resort's reception-area-turned-relief-centre and staying at its log-cabins, for free. About two-third of the volunteers were Thai, and others hailed from the United States, Great Britain and Switzerland.

The owner of the resort, who also works as an elementary school principal, has become known as a person who put charity before business.

Quotes from Survivors'  
Letters Expressing  
Their Sentiments of Gratitude

'As a family hit by the tsunami in Ko Phi Phi, we express our gratitude to all the people who helped us with such care – Thai officials and volunteers, Thai Airways International and the Government for a free flight to Bangkok.'

Thaler Family  
[ no country name ].

'Our deepest thanks to all the Thai people who alerted us of the impending danger and helped us to get away from the area devastated by the tsunami. Above

all, we thank the resort staff who rushed down to the beach to warn guests. We owe our lives to them, many of whom saved us whilst losing their own life, to the men who gave us a lift in their trucks, and the people of Takua Pa who provided us with water, clothes and food.'

John and Helen Sharpe,  
Kent, England.

'We express our deep gratitude to the Thai people for all the help, the friendliness and warmth shown us – local people, hotel employees, hospital staff, local authority officials, travel agency workers, many of whom helped us despite their personal sufferings.'

The Bjorkman Family,  
Stockholm.

'Special thanks to hotel staff who generously provided moneys for taxi fares, free-of-charge accommodation, food and telecommunication, as well as to officials who offered clothing, counselling, medical assistance, and free travel to Bangkok with Thai Airways International. The generosity of Thai people will be forever in my mind.'

Gilles R. Chenier,  
Ottawa, Ontario,  
Canada.

HAND-WRITTEN NOTE OF THANKS  
BY AN INJURED SURVIVOR

“To All Amazing People at Songkhla Nakarin Hospital”

“You have incredible love for patients and all people.

You are teachers for me.

You taught me love, kindness, care, happiness, ...

You are an example for me.

You are angels sent to us with this message.

I will cherish this message, apply it and pass it on.

You made a difference to me and thousands of patients.

We can't say “Thank you” enough.”

“P.S.: I would never have expected to be treated in such a professional way by amazingly knowledgeable doctors & nurses with such unconditional love.

Knowledge & unconditional love do not always “meet” together.

I can not see a lot of doctors showing up on New Year's Eve, or in their free time.

I can not imagine I would get better care in any other hospital.

I wish that all the patients around the world would get the same care as you gave here.

The smiles of the entire staff were the best medicine for me.

From all my heart - Thank you

Yours forever

(Ms) Petra Nemkova

NB: Authentic rendition, with minor corrections of grammar.

( A native of the Czech Republic – also interviewed for a TV documentary broadcast by ABC. )

HAND-WRITTEN LETTER OF THANKS  
BY AN UNHARMED SURVIVOR

Addressed to H.E. the Prime Minister,  
Royal Thai Government,

that letter, dated 4 February 2005,

reads as follows :

Dear Sir,

Let me send you this very informal letter and express to your government and the people of Thailand the greatest admiration and gratitude, as well as grief about victims of the tsunami disaster.

My name is Darina Belicov\_. I come from Slovakia, Central Europe. I and my husband witnessed the tsunami in Krabi Province, there at Railey Beach. I have learnt about criticism directed at you when watching TV and reading the newspapers. I would like to share my tourist views on those disastrous days, in telegram style.

Within two hours after the waves had struck, there was drinking water, bread and cookies. Helicopters started to monitor the coast. Within three hours, the injured and dead were taken inland. Within five hours, in spite of constant threats and warnings, the staff of restaurants whose dining rooms had been swept away served dishes free-of-charge. I raise my hat to their personal bravery and generosity.

Next morning, 27.12.2004, everybody who felt physical discomfort was evacuated to safety inland. We spent the next two days cleaning the beaches. On 29 December, at Krabi Airport, there was water, food, nurses, wheelchairs, T-shirts, flip-flops, and list of tourists hospitalized in alphabetical order and by nationality, which were constantly updated.

We could observe the transport of the injured to military airplanes – excellent

organization and work. Both I and my husband are mountain climbers, and we know how difficult it is to act in a mass-panic atmosphere.

To conclude, Sir, please accept our great, great THANK YOU. You should be proud of being the prime minister of such wonderful, brave, and hospitable country.

We will return soon.

Yours faithfully  
Darina Belicova

#### Reaction to a Survivor's Request

Mr. Arne Bivrin, a Swedish survivor, wrote to Mrs. Juthamas Siriwan, Governor, Tourism Authority of Thailand, requesting her "help to locate his wife's jewellery she was wearing when she drowned. She was wearing two golden rings on her left hand and a white-gold ring on her right. She was also wearing two thin golden necklaces. As you certainly understand, these rings and necklaces have great personal value to me and our surviving daughter. I'd be tremendously grateful for any assistance in finding these items."

To this request, Mrs. Juthamas Siriwan responded that "our officers found those pieces of jewellery" and requested Mr. Bivrin to advise whether to hand it over to Swedish police officers working at Talang, or to the Swedish Embassy.

Mr. Bivrin replied by expressing thanks from the bottom of his heart.





## A Brazilian Survivor's Tale

Mr. and Mrs. Gaudioso, Brazilian tourists who visited Thailand from 15 to 18 June 2005, told about a programme about the tsunami devastating Phuket and Phang-nga, especially Khao Lak, on a Brazilian television channel, interviewing Mr. Lopez, who was in Thailand on that fateful day (26 December 2004).

Mr. Lopez, relating his story with tears in his eyes, was impressed with the kindness of the Thai people. He was taking a walk in the hotel compounds when the seawater ebbed in an unusual way. Soon, there was a sound in the ocean, and many tourists, including some Thai, and the hotel staff shouted: "Run fast!" Everybody headed for high grounds. Children, women, and the feeble-bodied who could not run fast were sucked by the waves into the wild currents. Mr. Lopez's strength almost failed, but suddenly a hand pulled him to go on running and climbing up to high grounds where it was safe from the thrashing crests. There were about 7-8 survivors, with Mr. Lopez as the only foreigner. Many hours passed and no one was sure whether they would be safe if they went down. Hunger and thirst increased with the passage of time. One of the people had a bottle of water and he handed it to Mr. Lopez to take a sip first before handing the less than half-full bottle to everyone to wet their throats. When sure that the disaster was really over, they all climbed down with difficulty. The sandals Mr. Lopez was wearing had been lost since he was fleeing the waves. One of the Thai took off his sandals and gave them to him,

saying that the Thai are more used to walking bare-footed than he. At this point, overwhelmed by emotion, Mr. Lopez burst into tears. When he came to lower grounds, he was wearing only his swimming trunks. The hotel was washed to the grounds. His clothes, belongings and money were gone with the water. Everything was chaotic. There were wailings and moanings for the loss of lives and properties. But within that loss, the great loving kindness of the Thai people came to the fore. One villager handed him some clothes and shared with him the limited amount of food he had to keep him alive. Mr. Lopez returned safely to Brazil through the help of the Royal Thai Government, Thai volunteers, and the Brazilian Embassy. He emphasized that he would never forget the kindness of the Thai people as long as he lives.

Mr. and Mrs. Gaudioso who related this story said that the Brazilian TV channel ran this programme repeatedly. The Brazilians who had watched the programme were very impressed with and appreciated the Thai people. Many of the viewers said they would like to visit Thailand, the land of kind-hearted people, and the Gaudiosos were among them.

### **OFFICIAL RECOGNITION REFLECTING GRATITUDE FOR ASSISTANCE AND COMPASSION**

Their Majesties King Carl XVI Gustaf and Queen Silvia of Sweden were the highest-ranking personages who travelled to Thailand to personally express their deep gratitude to Their Majesties King Bhumibol and Queen



Sirikit as well as to the Thai Nation for the self-sacrificing way in which Swedish citizens had been helped.

Visiting areas devastated by the diabolic impact of the tsunami, Sweden's King Carl XVI Gustaf and Queen Silvia personally conveyed profound thanks, in February 2005, to survivors of fishing communities, who shared what little they had left with foreign victims, mounted search and rescue efforts, offered vehicles to transport survivors, sheltered foreigners in their private homes, and helped ensure their survival.

In the same vein, royalty from Denmark, Great Britain, and Belgium visited Thailand to convey their monarchs' and nations' grateful appreciation of all the help rendered to survivors.

Among eminent emissaries were former U.S. Presidents George Bush Senior and Bill Clinton, who spoke with great admiration of the resolve of Thai officialdom and local people's spirit to



mitigate the disaster impact.

The Prime Ministers of Canada, Denmark, Finland, Norway, and Sweden visited to thank the Royal Thai Government and the Thai people for all their compassion and assistance to citizens of their countries, who survived the devastating impact of the tsunami.

Such sentiments were conveyed by visiting government representatives from China, France, Germany, Italy, Japan, Spain, and the United States of America. With a view to Thailand hosting an aid coordination centre for the whole region, Thailand was praised for its response to the needs of other affected countries, "a powerful gesture of goodwill towards the region".

The gratitude expressed by numerous diplomats, in conveying their governments' profoundly grateful appreciation of all assistance given to tourists and expatriates who survived the tsunami, is echoed in observations summarized by the ambassadors to Thailand of Australia and of the United States of the America.

Australia's ambassador praised the Thai authorities for their skilful management of the tsunami crisis – "at every stage the Thai response has been inspired".

The ambassador of the United States of America commended Thailand in saying that no country had any problem with Thailand being the host for the regional assistance activities, which was a boost to Thailand's emerging regional leadership role.

## RELIEF

Given the devastation wrought upon people and the environment, there obviously was immense need for momentous and virtually limitless assistance. The death of one member of the Royal Family caught in the torrents of the giant waves signified the extent to which the disaster had struck the nation, as well as its many friends vacationing on the peninsular coast and islands of the Andaman Sea. Grief and sorrow led to compassionate action to rush to the survivors' relief and alleviate their hardship. The Supreme Patriarch of Thailand's Buddhist Sangkha donated two million baht for the support of disaster victims.<sup>109</sup>



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<sup>109</sup> Tsunami Phuket, pp. 81-83.



Their Majesties and the Royal Family graciously granted 30 million baht through the Rajapranugroh Foundation under Royal Patronage to help disaster victims in the six disaster provinces struck by the tsunami. By royal command, the foundation provided 2,250 care packages of milled rice, dried food and clothing for the relief of disaster victims. Of these care packages, 1,000 were distributed at the Takua Pa District Office, Phang-nga Province, 750 sets at the Krabi Provincial Hall, and 500 sets to victims in Phuket Province.<sup>110</sup> Moreover, royal assistance delivered by the Royal Thai Air Force consisted of 1,000 care packages, 54 rolls of white fabric required for wrapping corpses, and 275 coffins.<sup>111</sup> Through the disaster relief section of the Chaipattana Foundation under Royal Patronage, funds totalling 20,712,908.15 baht were granted to various foundations under royal patronage for assistance to disaster victims. Upon royal advice, the Thai Red Cross Society under Royal Patronage had calls sent out by E-mail for the donation of blood as well as medicine, white fabrics, paper tissues, canned food, underwear, sanitary pads, shoes, drinking water, blankets, formalin for the handling of corpses, and coffins.<sup>112</sup> Amounts of one million baht each were granted on behalf of the Somdej Ya Charity Foundation under Royal Patronage and

of the Kor. Wor. Foundation, which were administered by the Pok Tek Tueng Foundation to help disaster victims.<sup>113</sup> To expedite assistance for the affected people, the fund of more than 20 million baht, which had been budgeted for relief prior to the tsunami disaster, was released for the Rajapranugroh Foundation to ensure immediate relief of hardship faced by tsunami victims, particularly through supplies of drinking water, food, clothes and medicines.

The gracious mercy of Their Majesties and the Royal Family extended to tsunami victims and their communities to alleviate suffering and enable people to rebuild their lives has deeply touched as well as strongly encouraged all beneficiaries. It left a lasting imprint in foreign visitors' memory of the generosity which is innate to Thai culture.<sup>114</sup>

The Chaipattana Foundation under Royal Patronage opened a special account named "Southern Region Restoration Fund", to administer the numerous contributions from benefactors, including both Thai and foreign organizations, donated to support the Tsunami relief projects initiated by Their Majesties and,

<sup>110</sup> Tsunami Phuket, pp. 81-83.

<sup>111</sup> Tsunami Phuket, pp. 81-83.

<sup>112</sup> Tsunami Phuket, pp. 81-83.

<sup>113</sup> Tsunami Phuket, pp. 81-83.

<sup>114</sup> Phang-nga Tsunami, p. (9).

upon royal command, supervised by the Royal Family. To ensure that people will receive help in areas and aspects not yet covered, and aware that the sheer magnitude as well as complexity of the disaster were beyond the capability of a single foundation, royal advice facilitated to enter into joint ventures with other charitable organizations such as the Thai Red Cross Society under Royal Patronage, so as to work in concert and help by mobilizing the expertise of each and every organization.

The Thai Red Cross Society under Royal Patronage received sufficient donations to support a wide range of relief projects, in cooperation with the Chaipattana Foundation. These projects were aimed at securing the victims' survival through support for public health care, nursing of injured victims, and sanitation. Special assistance was provided to orphaned students by granting them scholarships.

The disaster relief staff of the Chaipattana Foundation was divided into three groups. Each group took care of two provinces. Their first assignment was to assess damage and to appraise aid provided by other organizations, particularly on remote islands with precarious transportation links, so as to make need assessments and to propose ways and means to provide help.

The six affected provinces, namely Ranong, Phang-nga, Phuket, Krabi, Trang and Satun are similar in that large proportions of people in coastal villages and towns have earned their living through fishery. Many of them lost their homes, their dories, small fishing boats, their trawlers, their hinged, floating fish cages and other fishing gear. Some members of the fishing communities lost everything, and others retrieved their damaged fishing boats or gear. Many others were traumatized and felt unable to venture out onto the sea, to catch fish the way they used to do.<sup>115</sup>

Disaster relief assistance granted through the Rajaprajanugroh Foundation was reinforced by many private-sector foundations and organizations as well as government agencies which cooperated to help schools and students affected by the disaster. The contributions comprised both instantaneous aid to meet urgent needs and support in the long run. Examples are the schools at Ban Bang Sak and Ban Thap Lamu. The buildings of the Ban Bang Sak School in Bang Muang Sub-district of Takua Pa District, Phang-nga Province, had been wiped off. Through a grant from the Privy Purse of H.M. the King to the Rajaprajanugroh



<sup>115</sup>“The Royal Benevolence Wiped Away Tears.” By Onanan Woothisen. Translated by Suleeporn Bunbongkarn. The Chaipattana Foundation Journal, August 2005, pp.29-30.

Foundation, funding was provided for the reconstruction of school buildings. By royal grace, the name of “Rajaprajnugroh 35 School” was conferred onto the rebuilt school, which was explicitly dedicated to the education of tsunami orphans. Granted royal patronage, the Ban Thap Lamu School in Thai Mueang District, Phang-nga Province, was provided funding for the reconstruction of buildings, supply of drinking water, and meals for students at lunchtime. In due course, many organizations, agencies, enterprises and private foundations joined to assist in the construction of instruction buildings with class-rooms, a library, auditorium, multi-purpose building, hostel, infirmary, computer centre, and canteen.<sup>116</sup>



tsunami and victims. Assistance to 15 families of deceased police officers in the provinces of Ranong, Phang-nga and Krabi totalled 450,000 baht. In Ranong Province, a Red Cross Chapter warehouse was built at the cost of 450,000 baht. The evacuation of homeless people in Ranong Province was supported with 3.4 million baht.<sup>117</sup> In Phang-nga Province, the laundering of clothes donated for disaster victims was financed with a contribution of 680,000 baht. Daily necessities to alleviate hardship in five villages of Khura Buri District for three months were provided at a cost of three million baht. The construction of a Red Cross Chapter office and a warehouse



The Thai Red Cross Society under Royal Patronage extended direct assistance to locations devastated by the

was financed with 4,320,000 baht.<sup>118</sup> In Trang Province, assistance to 306 elderly people on Libong Island was funded with 2.5 million baht. The care for 18 sick elderly people was supported at a cost of 150,000 baht.<sup>119</sup>

<sup>116</sup> Phang-nga Tsunami, pp. 34+38.  
<sup>117</sup> The Thai Red Cross Society. FRAMEWORK : To Restore the Livelihood – Assistance to Children – Housing – Public Health, Sanitation and Environment – CapacityBuilding. (Bangkok), no date. 8+3+6+5+5+2 = 29 print-outs of power-point templates. Henceforth referred to as The Thai Red Cross Society. FRAMEWORK in brief.  
<sup>118</sup> The Thai Red Cross Society. FRAMEWORK.  
<sup>119</sup> The Thai Red Cross Society. FRAMEWORK.

Help for children orphaned by the tsunami disaster fell under the responsibility of three ministries: the Ministry of Education, responsible for their education; the Ministry of Social Development and Human Security, responsible for their livelihood; and the Ministry of Public Health, responsible for their physical and mental health. They provided support to each provincial office. The provincial-level line agencies were responsible for all orphaned disaster victims, including infants, school-age children, and university students.<sup>120</sup> The number of tsunami orphans in the disaster areas within the six provinces totalled 882 children. They comprised 90 children who lost both parents, 398 children who lost their mother, 367 children who lost their father, and 27 children who lost their guardian and supporter.<sup>121</sup>

The initial help to each orphan was 1,000 baht per person, with confirmed evidence such as the death certificates of parents or supporters. If the evidence was not clear, officers would visit the house and conduct interviews as to the validity of the request for aid. Associations, offices, foreign organizations and individuals helped the orphans by donating money or educational support. The Social Development and Human Security office determined and managed help as appropriate under the circumstances.<sup>122</sup>



Long-term effective help such as support to promising students up to completion of tertiary-level education by graduation with the award of a Bachelor Degree was offered by the Rajapraja-



<sup>120</sup> Tsunami Phuket, p. 65.

<sup>121</sup> Tsunami Phuket, p. 65-66.

<sup>122</sup> Tsunami Phuket, p. 66.



nugroh Foundation. This Foundation coordinated with the provincial offices of the Ministry of Social Development and Human Security, to screen applications, interview applicants and recommend candidates for the award of long-term scholarships. All data and information were forwarded for discretion of the Foundation, with a view to its staff meeting with the nominated orphans.<sup>123</sup>

The Ministry of Foreign Affairs dispatched its officials to its coordinating centres set up in the provinces of Phuket, Phang-nga and Krabi as well as at Don Mueang International Airport, Bangkok, to facilitate the processing of foreign nationals' departure for their respective country by the issuance of Emergency Certificates free-of-charge for those who lost their travel documents as well as help coordinate with their respective governmental representative. As one of the concerned government agencies, the Ministry of Foreign Affairs joined in operating a centre offering One-Stop-Service, to facilitate speedy and convenient processing. As one of the agencies represented at this One-Stop-Service, the Ministry of Foreign Affairs assisted by coordinating with representatives of diplomatic missions based in the tsunami affected areas. This task entailed dealing with the issuance of relevant documents for the victims or their family members.<sup>124</sup>

The Centre for the Coordination of Disaster Victim Relief in the six provinces directed support from private-sector donors in Thailand and abroad to surviving victims. This support was worth 1,432.86 million baht, in total.<sup>125</sup> In the same vein, the National Women's Council ( *Sapha Satri Haeng Chat*) offered a monthly allowance of 2,000 baht to each family affected by the disaster, for two consecutive years.<sup>126</sup>

Experts of the Department of Mineral Resources, Ministry of Industry, studied the geophysical phenomenon of an increase in the number of geysers, upon tremors and tsunami impact, in the marine areas of Ban Pak Phu, Kapong District, and Ban Na Tai of Khok Kloi Sub-district, Takua Thung District. Experts of the Department of Pollution Control determined the quality of seawater and found it contaminated with rubbish and of high turbidity.<sup>127</sup>

A team of experts from the Ministry of Natural Resource and Environment and Chulalongkorn University surveyed the area of Kho Khao Island, Ban Bang Niang, Ban Nam Khem, Phra Thong Island and Khao Lak in order to define criteria and means of environmental protection. This was deemed necessary so as to safeguard against detrimental impacts upon any modifications and adjustment of the natural landscape, at the

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<sup>123</sup> Tsunami Phuket, p. 66.

<sup>124</sup> Summary of the Measures Implemented by the Ministry of Foreign Affairs of Thailand in the Aftermath of the Tsunami Devastation. Bangkok: Ministry of Foreign Affairs, (2005), items # 4 & 5.

<sup>125</sup> Tsunami Phuket, p. 83.

<sup>126</sup> Phang-nga Tsunami, p. 35.

<sup>127</sup> Phang-nga Tsunami, p. 50.

start-up of the rehabilitation of protected areas.<sup>128</sup>

Once the post-disaster situation had stabilized, the Ministry of Interior delegated disaster victim relief to the provincial authorities and concerned government line agencies. Thereupon, the operations of the Assistance Centre for Victims of the Tsunami Disaster at Phuket Provincial Hall (ACVTD) were wound up by 28 February 2005. Henceforth, continuing operations were coordinated among the six provinces hit by the disaster. Duties included relief operations for disaster victims concerning accommodation, community rehabilitation, restoration of tourism destination, occupational career development, rebuilding destroyed and repairing damaged public utilities, and restoration of the natural environment.<sup>129</sup>

### Royal Thai Armed Forces Relief Operations

Results of relief operations carried out by the Royal Thai Armed Forces are summarized by highlighting the assignment of duties, the operating units, and deployments.

The Royal Thai Armed Forces assisted the victims by constructing temporary shelters and providing basic necessities. Support was rendered to the retrieval of corpses through the construction of storage depots for coffins, the dispatching of dentists to assist in identifying corpses, the assigning of

medics to assist in sanitizing corpses at the morgue in the premises of the monasteries of Wat Yan Yao and Wat Bang Muang, and in the Bang Marang Graveyard in Phang-nga Province, as well as at the site maintained and operated by the Prachasantisuk Foundation in Krabi Province.

The Supreme Command Headquarter was responsible for managing and administering the distribution of items that had been donated to the South. The RTA monitored the distribution of items in the South, with the 4<sup>th</sup> Army Area carrying out the distribution on land. The RTN, through its 3<sup>rd</sup> Naval Fleet, was responsible for the distribution of items to citizens on all islands in the ocean. The RTAF was responsible for the transportation of items from airfields to destinations, with priorities for mobilizing items direly needed by affected people.

Operating Units involved were the centre for receiving donations, including the 6<sup>th</sup> Wing, 1<sup>st</sup> Infantry Regiment – King’s Own Guard, and 11<sup>th</sup> Infantry Regiment – King’s Own Guard. Collection points included the Phuket Airport Depot, Surat Thani Army District, and CDR-RTN Forward Detachment. Supply points were set up by army units in the area.



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<sup>128</sup> Phang-nga Tsunami, p. 50.

<sup>129</sup> Tsunami Phuket, pp. 76+78.

Deployment as planned entailed the management of different accounts that distinguished items into four categories, as follows: clothes; kitchen appliances and dried foods; medical curative and preventive medicine; and construction engineering devices. Construction of temporary shelters rendered the following results. The CDR-RTA Forward Detachment constructed 450 temporary shelters in the areas of Phang-nga Province and two schools in Krabi Province. The CDR-RTN Forward Detachment constructed 73 temporary shelters in areas of Phang-nga Province. The CDR-RTAF Forward Detachment constructed 236 temporary shelters in areas of Ranong and Phang-nga provinces. The CDR-AFDC Forward Detachment constructed 150 temporary shelters in Phang-nga Province. Upon completion of temporary shelter construction, relief items meeting the needs of victims were distributed.<sup>130</sup>

Within the first to fourth days after the disaster, approximately 5,000 people were helped back home by the Royal Thai Air Force and commercial airlines.

### Phang-nga Provincial Administration Relief Operations

The challenge to rush relief and reach survivors was particularly big in five districts of Phang-nga Province, given the fact that there the death toll was exceedingly high. Assistance was urgently needed in regard of support for

the bereaved, medical treatment, health care, alleviation of hardship, livelihood support, schooling, housing, environmental sanitation, and restoration of the natural environment.

### Support for the Bereaved

Two facets of relief implemented in Phang-nga Province reflect the violent force of the giant waves, as they lashed the shoreline and narrow flat-bottomed coastal strip.

Given the large number and high proportion of local people who died under the impact of the tsunami, and whose corpses were retrieved and identified, families and communities having also suffered material and financial losses were in need of financial assistance to arrange traditional funerals. The Ministry of Education supported each funeral ceremony for a deceased teacher by allocating 100,000 baht, and each funeral of a deceased student with an allocation of 35,000 baht. In this manner, altogether 134 funerals took place.<sup>131</sup>

Altogether 414 children were deprived of their parents, of their mother or father, or else of their guardian and supporter. Like in the case of Phuket Province, this figure might not yet include younger siblings of school-age orphans. Those registered received a stipend of 25,000 baht each through the Ministry of Education.<sup>132</sup>

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<sup>130</sup> “Defence. Missions and roles of the Royal Thai Armed Forces”. Draft paper. Thailand in the 2000’s. (in preparation) Bangkok, (2005). First version, pp. 8-11 / Enlarged version, pp. 12-15.

<sup>131</sup> Phang-nga Tsunami, p. 35.

<sup>132</sup> Phang-nga Tsunami, p. 35.



### Medical Treatment

In Phang-nga Province the victims who received treatment at public health service centres totalled 10,359, comprising 7,657 outpatients and 2,702 inpatients. The patients who were referred to other medical care facilities numbered 581. There were 308 patients who died in hospital. Takua Pa Hospital had 2,926 patients, by far the highest number among hospitals having treated injured victims. Survivors referred to public health service centers totaled 9,718, comprising 7,065 Thai, 2,466 foreign tourists, and 193 foreign labourers.<sup>133</sup>

Support centres offering medical and public health care services for tsunami victims were set up at temporary shelters and local public health service centers. Related tasks performed included improvement of environmental sanitation, mental rehabilitation of surviving

victims, and disease surveillance. These programmes were facilitated through domestic and foreign support.<sup>134</sup>

In total, there were 1,442 patients, including 1,390 Thai and 52 foreigners. By gender, there were 808 male patients and 634 female patients. The most frequent cases were 835 gastro-intestinal diseases including such water-borne diseases as diarrhoea, followed by 268 cases of wound infection, and 95 cases respiratory tract diseases such as pneumonia.<sup>135</sup>

The “Red Cross Project for Physical and Mental Recovery” was established to provide medical supplies, non-addictive drugs, as well as medical equipment and tools, which were donated by people from all walks of life. A team visited victims at Phang-nga Hospital, in Takua Pa District, at the shelters of the monasteries of Wat Bang Muang, Wat Yan Yao, and Wat Lak Kaem, as well as at the shelters in Ban Bang Niang, Khao Lak, Ban Pak Wip, Bang Muang, Ban Nam Khem, and Ban Nai Rai. Sponsors were

<sup>133</sup> Phang-nga Tsunami, p. 55.  
<sup>134</sup> Phang-nga Tsunami, p. 54.  
<sup>135</sup> Phang-nga Tsunami, pp. 57-58.

the Sirindhorn Red Cross Office of Thung Song District, Thung Song Hospital, and various other organizations.<sup>136</sup>

Donations solicited by the Phang-nga Red Cross chapter were one urgently needed refrigerator (5.5 cubic metres) to store blood for Phang-nga Hospital, with the capacity to store 720 containers, valued at 740,000 baht. Also, five beds required for blood donation valued at 100,000 baht were received by the Takua Pa Hospital, to replace the ones completely worn-out.<sup>137</sup>



## Health Care

A disease surveillance program was activated within three days after the calamity by the Department of Disease Control that had mobilized physicians and paramedical staff from various organizations. The surveillance covered 21 diseases, which were grouped into six



categories, namely, diarrhoea, respiratory ailments, feverish diseases, neurological illness, hepatitis, and wound infections. Surveillance rendered evidence that more diseases occurred with high probability of becoming epidemic such as mumps and chicken pox. Hence, the surveillance covered 23 diseases.<sup>138</sup>

Public health officials took random samples of food prepared for sale daily, to conduct tests so as to safeguard against contamination with coliform bacteria. Persons in charge of preparing meals and handling food were subject to strict controls. They were obliged to ensure maintaining the required standards in terms of hygiene and sanitation. Simultaneously, the public health officials provided bottled clean water to all. Water in ponds of monastery premises used for purposes other than consumption was continuously sterilized using automatic chlorine filters. Surveillance and testing to determine the level of risk-free chlorine residues were performed daily, to ensure that the standard limit was not exceeded.<sup>139</sup>

<sup>136</sup> Phang-nga Tsunami, p.72.

<sup>137</sup> Phang-nga Tsunami, p. 75.

<sup>138</sup> Phang-nga Tsunami, pp. 57-58.

<sup>139</sup> Phang-nga Tsunami, pp. 57-58.

## Alleviation of Hardship

Donations to alleviate hardship in evacuees' shelters of Takua Pa District, Phang-nga Province, were sent from several neighbouring provinces in South Thailand. For example, the women farmers group of Pattani Province supported 13 victims with 1,000 baht each; the women farmers group of Songkhla Province assisted 40 victims by offering each 1,000 baht; the women farmers group of Nakhon Si Thammarat Province presented 25 victims with one set of kitchenware each; and students of the Prince of Songkla University donated 32 sets of kitchenware to 32 victims.<sup>140</sup>



The Phang-nga Chapter of the Thai Red Cross Society had immediately mobilized teams and made appeals for help from the general public, business people and government officials to cooperate in cooking food for the victims. Hence, the project of “prepared food in boxes”, or meal boxes was launched out of the Governor’s official residence. The big, improvised kitchen prepared food to fill 6,000 – 10,000 meal boxes daily, which were delivered to surviving victims at Phang-nga Hospital as well as in Takua Pa and Thai Mueang districts.<sup>141</sup>



Other projects were such activities as “Consoling Victims”, “Motherly Love” and “Laundering Clothes Donated for Victims”. The distribution of donations was organized and implemented to deliver consumer goods, medical supplies, milled rice, dried food, clothes, kitchenware, electrical appliances, bedding, utensils, and beverages. Once the crisis was over and the situation began to normalize, the emphasis shifted to restoring occupation, mental rehabilitation, and housing. These tasks were tackled in cooperation by the Chaipattana Foundation under Royal

<sup>140</sup> Phang-nga Tsunami, p. 20.

<sup>141</sup> Phang-nga Tsunami, p. 65.

Patronage, the Thai Red Cross Society under Royal Patronage, the Red Cross Society Federation, the International Red Crescent Society, and other domestic as well as foreign organizations. The Phang-nga Red Cross Chapter actively supported such projects as the Phru Tiao Red Cross Village and the Ban Nam Khem Infant Nursing Centre.<sup>142</sup>

The project titled “Meal Boxes to the Hearts of Tsunami Victims” required the preparing of cooked food three times a day, early and late morning as well as in the afternoon. Meal boxes were delivered to victims in temporary shelters such as at Bang Niang, Khao Lak, Ban Pak Wip, Bang Muang, Ban Nam Khem, Wat Bang Muang, Wat Yan Yao and Pan Yi Island. The raw materials were donated by people from all walks of life. Money donations were made by supporters such as the ITV Company which contributed 500,000 baht. The CP Food Products Company contributed chicken meat. A petroleum firm in Nong Bua Lam Phu Province contributed milled rice and dried food.<sup>143</sup>

The project titled “Consoling Victims” was launched to deliver consumer goods to victims in disaster areas. The schedule of visits was as follows:

1<sup>st</sup> Visit : A team visited victims at Phang-nga Hospital and the shelters at Wat Lak Kaen, Ban Thung Khamin and Ban Bang Niang. The relief supply on this visit comprised 400 sets known as “Stream of Goodwill” [“*Thara Nam Chai*”



~ ‘stream of compassion’] and 600 royal survival kits [“*Thung Yang Chip Phraratchathan*”]. Sponsors included the Office of Disaster Relief and Community Health Protection, Public Health Office of Bang Sak Sub-district, Kwangpaisan Manufacturing Company, Nakhon Pathom Provincial Office of Disaster Relief and Mitigation, Krabi Cropping Promotion Centre, and Kimberly-Clark Corporation.

2<sup>nd</sup> Visit : A team visited victims at Ban Nai Rai, Kho Khao and Phra Thong islands, as well as the shelters of Samakkhitham Monastery, Ban Bon Rai, Chong Fa Waterfall, and Ban Bang Niang. The relief supply on this visit comprised consumer goods, clothes, wearing apparel, pillows, mosquito nets, bedding, and kitchenware. Sponsors were the Nakhon Pathom Provincial Office, Suphan Buri Provincial Office, and Tak Provincial Office.



<sup>142</sup> Phang-nga Tsunami, p. 65.

<sup>143</sup> Phang-nga Tsunami, p. 69.

3<sup>rd</sup> Visit : A team visited victims on Nok and Phra Thong islands, as well as at the shelters of Chong Fa Waterfall, Bang Muang, Ban Bang Niang, and Ban Nam Khem. The relief supply on this visit comprised 2,000 royal survival kits, kitchenware, household commodities, consumer goods, drinking water and insect repellent. Sponsors were the Hahnam Singh Harbingers (Sajjadeva) Foundation, Nan Provincial Office, Chaiyaphum Provincial Office, Prachuap Khiri Khan Provincial Office, Phang-nga Provincial Office, 2M (Med-gear) Company, and Samut Sakhon Provincial Office.

4<sup>th</sup> Visit : A team visited victims at the shelters of Phru Tiao, Ban Nok Na, Ban Hin Lat, Bang Muang, Khuek Khak, Bang Pak Wip, Ban Thap Tawan, and Bo Hin Waterfall. The relief supply on this visit comprised 3,500 royal survival kits, consumer goods, kitchenware, clothes, and wearing apparel. Sponsors were the Rajaprajanugroh Foundation, Kuwait Red Crescent Society, and Office of Disaster Relief and Community Health Protection.

5<sup>th</sup> Visit : A team visited victims at the shelters of Chong Fa Waterfall, Ban Nai Rai, Ban Thap Lamu, Ban Nam Khem and Ban Thung La-ong. The relief supply on this visit comprised 500 royal survival kits, kitchenware, clothes, drinking water, wearing apparel, and electrical appliances. Sponsors were the Phuean Phueng (Pha) Foundation under Royal Patronage, Sirindhorn Red Cross

Office of Thung Song District, and Kuwait Red Crescent Society.

6<sup>th</sup> Visit : A team visited victims at the shelters of Ban Thung Khamin, Ban Bang Niang, Bang Muang, and Ban Phru Tiao. The relief supply on this visit comprised 1,700 royal survival kits, consumer goods, milled rice, and construction equipment. Sponsors were a group of trading companies, the Ministry of Industry, the Sawan Phaephaisan Thammasathan Foundation, the Hat Yai Amnuaywit School, and the Chon Buri Provincial Office.

7<sup>th</sup> Visit : A team visited victims on Ko Yao and Phra Thong islands. The relief supply on this visit comprised 900 royal survival kits, consumer goods, milled rice, and construction equipment. Sponsor was the Sakon Nakhon Provincial Office.

8<sup>th</sup> Visit : A team visited victims in Ban Nam Khem. The relief supply on this visit comprised 1,600 sets of stainless-steel kitchenware, clothes, and bedding. Sponsors were the Korean Industrial Corporation and the Malaysian National Women's Council.<sup>144</sup>

The project titled "Motherly Love" distributed relief supplies to orphans. This project was supported by various organizations such as the Office of Disaster Relief, the Office of Water Resources Development Region 8, the Kor. Kiatchai Transportation Development Company, and the Kingdom of Saudi Arabia.<sup>145</sup>

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<sup>144</sup> Phang-nga Tsunami, pp.69-72.

<sup>145</sup> Phang-nga Tsunami, p.73.



The project titled “Laundering Clothes Donated for Victims” processed the huge bulk of clothes that had been contributed by domestic and foreign donors, and kept in storehouses of district offices. These clothes were washed, categorized and sorted by size for distribution. In the process, employment opportunities for survivors were created. Part of the laundering and ironing was supported by the Laguna Services Company, and part of the bulk laundering was sponsored by the Sirindhorn Red Cross Office of Thung Song District, Nakhon Si Thammarat Province.<sup>146</sup>

### Livelihood Assistance

Indemnities due to relations of persons missing and lost in the tsunami impact totalled 66.48 million baht for 185 cases. Deceased employees with entitlement numbered 300 persons, and their total indemnity amounted to 108.09 million baht. Altogether 93 injured, entitled victims were allocated 350,000 baht, in total.<sup>147</sup>

Compensation paid for loss of livestock totalled 856,957 baht.<sup>148</sup> To alleviate hardship faced by farmers short of fodder who were rearing livestock, the Phang-nga Provincial Livestock Office provided 32 sets of water tanks for cattle, supplemented by 2,850 sheaves

of fodder offered by the Livestock Research and Development Centre and 500 kilograms of concentrated feed donated by the C.P. Agricultural Industry Co., Ltd. These support packages were delivered to farmers in Kho Khao Sub-district of Takua Pa District and Na Toey Sub-district of Thai Mueang District.<sup>149</sup> Moreover, 45 sets of cattle feed contributed by the Food and Agriculture Organization of the United Nations (FAO) were distributed to 23 farmers affected by the disaster in Bang Na Toey Sub-district of Thai Mueang District and altogether 22 farmers in Khuek Khak, Bang Muang, and Kho Khao sub-districts of Takua Pa District. The value of this FAO contribution amounted to 102,100 baht.<sup>150</sup>

The provincial line agency of the Ministry of Labour and Social Welfare arranged for severance payment to some 250 employees of 23 defunct employers with proven entitlement, disbursing the total sum of 3,358,883.40 baht.<sup>151</sup>

The project titled “Upgrading of the Women Occupation Development Centre in Ko Yao District” was started by modifying the garage of the District Office to serve as occupational training centre for female tsunami victims. A budget of 157,530 baht was solicited by the Phang-nga Red Cross Chapter as donation from the Avon Cosmetics (Thailand) Company. It was used to provide equipment and tools for training.<sup>152</sup> Donations amounting to 37,150 baht were used to purchase materials and equipment for the Women Batik Manufacturing in Krasom Sub-district of Takua Thung District.<sup>153</sup>

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<sup>146</sup> Phang-nga Tsunami, p.74.

<sup>147</sup> Phang-nga Tsunami, p.41.

<sup>148</sup> Phang-nga Tsunami, p. 30.

<sup>149</sup> Phang-nga Tsunami, p. 31.

<sup>150</sup> Phang-nga Tsunami, p. 31.

<sup>151</sup> Phang-nga Tsunami, p. 44.

<sup>152</sup> Phang-nga Tsunami, p. 75.

<sup>153</sup> Phang-nga Tsunami, p. 75.

## Schooling

The Phang-nga provincial administration, in cooperation with the Phang-nga Chapter of the Thai Red Cross Society under Royal Patronage, established a nursery school at Ban Nam Khem in Bang Muang Sub-district of Takua Pa District. A cooperative, established in compliance with royal advice, has supported the students and parents, especially tsunami orphans and their foster parents. The Thai Red Cross Society contributed 2,730,000 baht for construction, 270,000 baht for landscaping, and 1,508,140 baht for student bursaries, totaling 4,508,140 baht.<sup>154</sup> The Phang-nga Red Cross Chapter sought the cooperation of an army detachment to construct the building and improve the landscaping. Under the project, stationery, instruction materials, and toys will be provided. The Phang-nga Red Cross Chapter requested the royal favour of conferring the name onto the new building. Concerning the administrative cost, the Phang-nga Red Cross Chapter provided the budget for the first year of operation, in the expectation that the Local Administrative Organization of Bang Muang Sub-district would allocate a budget from the second year onward. Toys were donated by the Thai Toy Manufacturers Association. The Department of Water Resources assumed the responsibility for clean water supply. As of the first year, 106 children were in the care of the new nursery centre.<sup>155</sup>



The Phang-nga Chapter of the Thai Red Cross Society under Royal Patronage offered scholarship valued at 60,000 baht over a four-year period to altogether four students and contributed 5,000 baht to the stipend for each of 84 injured students. Many other organizations and agencies offered stipends, clothes, stationery, textbooks, bicycles, or toys to students and teachers among the tsunami victims.<sup>156</sup>

The canteen building at Ban Hin Lat School in Khura Buri District, which had been damaged by landslide, was repaired at the cost of 293,878 baht, and a drinking water filter system was installed at the cost of 37,700 baht.<sup>157</sup>

<sup>154</sup> Phang-nga Tsunami, p. 39.

<sup>155</sup> Phang-nga Tsunami, p.73.

<sup>156</sup> Phang-nga Tsunami, p. 35.

<sup>157</sup> Phang-nga Tsunami, p.75.

## Housing

The project titled “Temporary Shelter Construction at Samakhi Monastery” consisted of 30 units constructed at a cost of 1.2 million baht for victims in Khura Buri District. The fund had been donated by the Hong Kong Red Cross Society. The abbot supervised the construction.<sup>158</sup>

The project titled “Phru Tiao Red Cross Housing” constructed 80 permanent homes for the victims in 40 buildings on six hectares of land granted by the Crown Property Bureau. This project at Ban Phru Tiao in Bang Nai Si Sub-district, Takua Pa District was valued at 12,650,265 baht. The Phang-nga Red Cross Chapter sought the cooperation of an army detachment to construct the houses. The developers were merely charged the cost of materials amounting to 9,600,000 baht. The Royal Thai Armed Forces shouldered the additional cost of 3,050,365 baht.<sup>159</sup>

## Environmental Sanitation

The quality of water and the environmental hazard posed by garbage were surveyed, in cooperation, by the Pollution Control Department and the Office of Natural Resource and Environmental Policy and Planning, Ministry of Natural Resource and Environment.

Water resources in the affected areas, including ponds and abandoned mining pits, for example in the coastal area of Tha Mueang District as well as near the cove of Khao Lak and at Ban Nam Khem

in Takua Pa District, were surveyed by teams of experts from provincial line agencies and found of acceptable quality, except for some turbidity caused by sediments. The greater was the urgency to dispose of sewage into cesspools and ensure sanitation by rigorous garbage disposal. Sewage treatment was resumed, buildings offering accommodation were disinfected, public pools were chlorinated, and local people were instructed how to determine coliform and chlorine residues in water so as to safeguard against contamination.<sup>160</sup>

## Restoration of the Natural Environment

To ensure the rapid and wholesome recovery of the natural marine environment, the seabeds of the national marine parks surrounding the Similan and Surin archipelagos, as well as of the Khao Lam Pi – Hat Thai Mueang and Ra Archipelago – Phra Thong Island national parks were cleared of debris in as far as feasible, using the equipment available.<sup>161</sup>

## Phuket Provincial Administration Relief Operations

Serving as an international bridgehead, the island province of Phuket responded to a particular variety of challenges. As documented, helping foreign visitors featured prominently in its relief operations. Hence, assistance was urgently needed in regard of support for the bereaved, medical treatment, health care, alleviation of hardship, helping foreigners, livelihood support, schooling, housing, infrastructure rehabilitation, and restoration of the natural environment.

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<sup>158</sup> Phang-nga Tsunami, p. 74.

<sup>159</sup> Phang-nga Tsunami, p. 73.

<sup>160</sup> Phang-nga Tsunami, p. 49.

<sup>161</sup> Phang-nga Tsunami, p. 50.

## Support for the Bereaved

In Phuket Province, 167 children were orphaned. They included four children who lost both parents, 78 children who lost their mothers, 73 children who lost their fathers, and twelve children who lost their guardian and supporter. It was assumed that there might be even more non-registered orphans. Officials in charge of surveying and recording came across school-age children registered as orphans who had younger, pre-school-age siblings not registered as orphans. In short, likely more than 167 children became orphans and would be entitled to receive assistance.<sup>162</sup>

The Phuket Chapter of the Thai Red Cross Society under Royal Patronage received donations to the amount of 6,395,579.42 baht. Part of that money was used to set up an endowment with which to create the Phuket Red Cross Society Foundation for Disaster Children to fund long-term scholarships up to at least bachelor-degree level for students who lost their mother or father, or both parents in the disaster.<sup>163</sup> A portion of donations, received by Phuket Province from 15 countries totaling 82.04 million baht, was earmarked to provide scholarships.<sup>164</sup>

### Medical Treatment & Health Care

Many injured disaster victims including tourists received medical treatment at



government and private hospitals, with costs defrayed by the government. In total, 1,500 patients were treated within the first three days.<sup>165</sup>

Owing to the large-scale treatment of many victims who had suffered a great variety of injuries, the Public Health and Sanitation Department stepped up safeguards against any outbreak of infectious diseases. In Phuket a Communicable Disease Control Operation Centre was set up and surveillance as well as rapid-response teams were dispatched throughout the province's Mueang, Thalang and Kathu districts. To keep any disease outbreak under control, medical experts paid attention to two main, possible diseases, diarrhoea and hemorrhagic fever. Findings were disseminated through daily status reports.<sup>166</sup>

The disease control team had to be watchful in many ways. Its task included the setting-up of an emergency disease control system and the prevention of diseases such as sepsis spreading in hospitals. To survey, control and prevent diseases, as well as to improve sanitation

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<sup>162</sup> *Tsunami Phuket*, pp. 65-66.

<sup>163</sup> *Tsunami Phuket*, pp. 67-68+71.

<sup>164</sup> *Tsunami Phuket*, p. 83.

<sup>165</sup> *Tsunami Phuket*, pp. 54-55.

<sup>166</sup> *Tsunami Phuket*, pp. 56-57.

and ensure hygiene, food and drinking water samples were collected for testing. The amount of chlorine in drinking water was checked, environmental sanitation was improved by restoring wastewater treatment, and garbage was collected and incinerated. Teams gave tetanus and vaccine injections against measles to injured victims. They handed out first-aid kits, antibiotics as well as common remedies, and gave advice on proper hygiene and sanitation. Officials of the provincial Public Health Department also visited and checked staff in charge of food-preparation, and gave instructions to owner-operators, so as to maintain internationally acceptable standards of hygiene and sanitation.<sup>167</sup>

Availing of a portion of support funding received from 15 countries to the total amount of 82.04 million baht, 14 million baht have been earmarked for the construction of two public health centres at the cost of seven million baht each.<sup>168</sup>

### Alleviation of Hardship

Many rescue centres were set up to receive, collect, and distribute donations for the disaster victims, including blood, medical supplies, and daily necessities. People from many places and all walks of life donated milled rice, canned and dried food, drinking water, clothes, daily necessities, appliances, coffins, as well as other goods and things that were needed. Money was donated to funds in support of disaster victims. Soon, help



came streaming in from all over Thailand once the dire need was widely realized.<sup>169</sup>

The Phuket Chapter of the Thai Red Cross Society under Royal Patronage was one of the many important organizations that provided relief from the disaster. Many foreign and Thai volunteers joined in the relief operation. The Phuket Chapter of the Thai Red Cross Society also was supported internationally and by Chapters in other provinces. Care packages were distributed and practical advice was given to disaster victims.

Much money and living necessities were donated to the victims. The Phuket Chapter of the Thai Red Cross Society set up a mobile team. Its members worked during 26 December 2004 through 24 January 2005, visiting disaster victims and delivering donations to alleviate hardship in the provinces of Phuket, Krabi and Phang-nga. By royal command of Their Majesties and the Royal Family, the members of the Phuket Red Cross Chapter delivered royal survival kits, 'kindness bags', throughout the disaster area on Phuket Island. They distributed royal survival kits to 1,472 recipients in Mueang District, 1,552

<sup>167</sup> Tsunami Phuket, p. 57.

<sup>168</sup> Tsunami Phuket, p. 83.

<sup>169</sup> Tsunami Phuket, p. 23.

recipients in Thalang District, and 1,122 recipients in Kathu District, totaling 4,146 recipients. A royal survival kit, 'kindness bag' or care package contained dried food, a blanket, clothes, shoes, and personal utensils.<sup>170</sup>

### Helping Foreign Tourists

Phuket Province set up an International Victim Coordination Centre at the Provincial Administration building. Many foreign residents and tourists volunteered their services at this centre such as those who provided treatment and those who looked after survivors and for missing persons, registering data and information for the issuance of important documents and passports, and helping in the repatriation of victims. Representatives from the Thai government arrived in Phuket to meet with and to confirm to the embassies of twenty-eight countries that they would be responsible for all expenses in helping injured or dead foreigners in Thailand. The Thai government also set up Foreign Tourist Administration Centres in the six provinces of the Andaman Sea coast to provide help to foreign tourists. The Ministry of Foreign Affairs set up and operated a 24-hour Coordination Centre in Bangkok to assist foreign victims of the tsunami disaster to register and to exchange information.<sup>171</sup>

Operating officers coordinated documents and issued temporary passports. Within the first four days, approximately



5,000 people were helped back home by the Royal Thai Air Force and commercial airlines.

For foreign victims of the disaster who wished to return home, the first procedural step was to transfer to Phuket International Airport, where they were provided with drinking water, food, and temporary accommodation in the airport area and various locations nearby. Upon arrival in Bangkok, the Tourism Authority of Thailand, the Tourist Police,



<sup>170</sup> *Tsunami Phuket*, pp. 67-68+71.

<sup>171</sup> *Tsunami Phuket*, pp. 57-58.

<sup>172</sup> *Tsunami Phuket*, pp. 58-59.

and the Association of Thai Travel Agents (ATTA) assumed the responsibility to take care of the visitors. Also, the Royal Air Force set up a disaster victim relief centre at Phuket International Airport, which was operated as a temporary hospital for the treatment and care of injured tourists. Volunteers helped with translating, arranging documents, and contacting diplomatic missions. For disaster victims waiting for their departure to return to their home country, temporary accommodation was provided by Phuket Rajabhat University. In Bangkok, the Tourism Authority of Thailand provided temporary and free accommodation at the Asian Games athletes' dormitories on the Rangsit Campus of Thammasat University, located at a moderate distance (20 kilometres) to Bangkok's Don Mueang International Airport.<sup>172</sup>

### Livelihood Support & Schooling & Housing

Phuket Province received help from 15 countries with donations totalling 82.04 million baht. A portion of 4.5 million baht was earmarked to support the fishing industry. Using an amount of 22 million baht, a small and medium scale enterprise (SME) project has been launched in cooperation with the German Government.<sup>173</sup>

### The repair of buildings of three

<sup>173</sup> [Tsunami Phuket](#), p. 83.

<sup>174</sup> [Tsunami Phuket](#), p. 83.

<sup>175</sup> [Tsunami Phuket](#), p. 83.

<sup>176</sup> [Tsunami Phuket](#), p. 83.

<sup>177</sup> [Tsunami Phuket](#), p. 83.



schools costing five million baht will be financed using a portion of support funds from 15 countries totaling 82.04 million baht.<sup>174</sup>

The construction of 79 permanent houses at a total cost of 35.12 million baht will be financed from funds contributed by donors in 15 countries, totalling 82.04 million baht.<sup>175</sup>

### Infrastructure Rehabilitation & Restoration of the Natural Environment

Portions of the support funding contributed by donors from 15 countries, totalling 82.04 million baht, have been allocated for the reconstruction of buildings of the Kamala District Office, requiring 4.5 million baht per unit, and to repair public utilities.<sup>176</sup>

An amount of 1.89 million baht, a part of the support funding provided by donors from 15 countries totaling 82.04 million baht, has been disbursed to recover natural resources and restore the environment.<sup>177</sup>

## MASS MEDIA SUPPORTIVE INTERVENTION

Thailand's mass media played very significant roles in reporting and updating on the immediate aftermath of the disaster. They also helped to appeal for help, informing the public where the need for help was most pressing, and what assistance was urgently required, at which point in time. For example, just a few days after the horrendous devastation, the mass media called for a halt in the donation of clothing and appealed for donations of dried, ready-to-eat food as well as coffins. Also, the number of volunteers needed to be increased drastically, to reinforce the rescue and relief force already working at the sites where the disaster had struck.

Reacting to the calls for help published in newspapers and broadcast by radio stations as well as television channels, many people donated money to alleviate the hardship faced by surviving victims. Donations solicited and transferred to the needy by the mass media amounted to 263 million baht (approximate equivalent US\$6.6 million or €5.3 million). This amount accounted for about twelve percent of the combined donations channelled through the mass media and Government agencies (the latter totalling some 2,000 million baht [approximate equivalent US\$50 million or €40 million]). In the same vein, the foreign language press and electronic media gave significant support by rallying support and soliciting contributions from the international community, particularly during the phase of relief operations.

<sup>178</sup> Tsunami Phuket, p. 85.

<sup>179</sup> Tsunami Phuket, p. 86.

<sup>180</sup> Tsunami Phuket, p. 86.

## OFFICIAL RECOGNITION OF ASSISTANCE IN DISASTER RESCUE AND RELIEF AND INTERNATIONAL CONTRIBUTIONS

His Majesty King Carl XVI Gustaf of Sweden and Her Majesty Queen Silvia visited Phuket and Phang-nga provinces as guests of Their Majesties the King and Queen of Thailand. His Majesty King Carl XVI Gustaf of Sweden appreciated the relief to Thai and foreign disaster victims. Sweden offered to help in restoring the environment. H. M. the King of Sweden had 100 fishing boats presented to fishermen along the coasts of Phang-nga, Phuket, and Krabi provinces.<sup>178</sup>

Two former U.S. presidents, Mr. George Bush Senior and Mr. Bill Clinton, visited Thailand as government guests. Their arrival helped determine the situation and find the way to help disaster victims.<sup>179</sup>

Mr. S.R. Nathan, President of Republic of Singapore, visited Phuket.<sup>180</sup>







Mr. Colin Powell, the then U.S. Secretary of State, and Mr. Jeb Bush, Governor of Florida, and their team arrived in Phuket. They checked the relief operations, and observed the collection of corpses. The purpose of their visit was to determine the kind of relief needed from the United States, in the short run as well as long run.<sup>181</sup>

Mr. Paul Martin, Canadian Prime Minister, his spouse and members of his cabinet, visited Kamala Sub-district, Kathu District, Phuket.<sup>182</sup>

Mr. Recep Tayyip Erdogan, Prime Minister of the Republic of Turkey visited, as a government guest, the disaster area in Phuket. The Turkish government donated US\$125,000 and three lots of medical supplies, seconded five DNA identification professionals with equipment to check the DNA of disaster victims, and sent four Turkish Red Crescent officers to support disaster relief in Phuket.<sup>183</sup>

<sup>181</sup> Tsunami Phuket, p. 87.

<sup>182</sup> Tsunami Phuket, p. 87.

<sup>183</sup> Tsunami Phuket, p. 87.

<sup>184</sup> Tsunami Phuket, p. 88.

<sup>185</sup> Tsunami Phuket, p. 89.

Mr. Goran Persson, Prime Minister of the Kingdom of Sweden, Mr. Kjell Magne Bondevik, Prime Minister of the Kingdom of Norway, and Mr. Matti Vanhanen, Prime Minister of Finland showed their appreciation of the help extended by the Thai government and the numerous Thai people who had helped citizens of their own countries. The Swedish government provided medicine supplies and 20 containers, a forensic science unit and medical science officers. The government of Norway sent airplanes to transfer Norwegians back to their home country. Finland provided a forensic science unit and medical science officers and donated 25 million EURO to the World Health Organization (WHO), UNICEF and private relief organizations.<sup>184</sup>

Mr. Yoon Jee Joon, Ambassador of South Korea to Thailand, visited and showed his appreciation to the Thai government and local administration.<sup>185</sup>

Mr. Gianfranco Fini, Deputy Prime Minister and Foreign Minister of Italy, and Mrs. Stefani Prestagiacomo, Minister of Equal Opportunity Enhancement, visited.<sup>186</sup>

Mr. Hani Abdullah Mominah, Chargé d'Affaires of the Kingdom of Saudi Arabia in Thailand, arrived to donate 75 tons of utilities, food and medical supplies worth US\$800,000.<sup>187</sup>

Mr. Alexander Downer, Foreign Affairs Minister of Australia, visited and gave his support to the Thai government to transfer the tsunami disaster corpses back home for their religious ceremonies. The Australian government assumed responsibility for all expenses.<sup>188</sup>

The Hon Phil Goff, Foreign Affairs Minister of New Zealand, visited Phuket.<sup>189</sup>

Mr. Michel Barnier, Foreign Affairs Minister of France, and French journalists visited. The Minister pledged airplanes and disaster rescue equipment to support the Thai government, and visited disaster victims including patients.<sup>190</sup>

Mr. Bernard Bot, Foreign Affairs Minister of the Netherlands, visited accompanied by the Ambassador of the Netherlands to Thailand, and commended the International and Thai Forensic Science Identification teams for their work. The visitors expressed their appreciation of the operation of the Thai government and concerned sections in tackling the crisis immediately and effectively.<sup>191</sup>

Mr. Jack Straw, British Foreign Secretary, showed his appreciation of the relief operations of the Thai people and the Thai government.<sup>192</sup>

The Rt. Hon. Estelle Morris MP, Minister of the Arts, Department of Culture, Media & Sports, and her team met to discuss assistance to disaster victims and recovery of the tourism industry, and to find ways and means to mobilize professionals with competency in disaster warning. The minister also visited the DVI team.<sup>193</sup>

Mrs. Margherita Boniver, Deputy Foreign Affairs Minister of Italy, visited and thanked the Thai people and Thai government for the relief assistance to Italian disaster victims.<sup>194</sup>

Mr. Takao Furuya and his team of twelve persons, representatives of Fuefuki Prefecture, Yamanashi Province, Japan, visited and donated money to alleviate the hardship faced by victims.<sup>195</sup>

Mr. Jan Peterson, Foreign Affairs Minister of Norway, thanked the Thai people and the Thai government for the assistance extended to Norwegian disaster victims.<sup>196</sup>

Mr. Chris Ellison, Minister for Justice and Customs of Australia, thanked the administration of the province and its people for relief assistance to disaster victims.<sup>197</sup>

Ms. Cataliya McIntoch, Representative of UNICEF, and her team arrived to do fact finding about damaged schools and discuss a relief plan.<sup>198</sup>

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<sup>186</sup> [Tsunami Phuket](#), p. 89.

<sup>187</sup> [Tsunami Phuket](#), p. 89.

<sup>188</sup> [Tsunami Phuket](#), p. 90.

<sup>189</sup> [Tsunami Phuket](#), p. 90.

<sup>190</sup> [Tsunami Phuket](#), p. 90.

<sup>191</sup> [Tsunami Phuket](#), p. 90.

<sup>192</sup> [Tsunami Phuket](#), p. 90.

<sup>193</sup> [Tsunami Phuket](#), p. 91.

<sup>194</sup> [Tsunami Phuket](#), p. 91.

<sup>195</sup> [Tsunami Phuket](#), p. 92.

<sup>196</sup> [Tsunami Phuket](#), p. 92.

<sup>197</sup> [Tsunami Phuket](#), p. 94.

<sup>198</sup> [Tsunami Phuket](#), p. 94.

## REHABILITATION

Assistance to relieve the plight of surviving victims was soon transformed into support encompassing a great variety of programmes and projects which have been geared toward wholesome rehabilitation. Thailand's three eminent Institutions, Monarchy, Religion, and Nation, led the country on the course of reconstruction and restoration.



The overriding concern was to enable the surviving victims in the worst-hit disaster areas to start rebuilding their lives. The corresponding support measures covered various essential requirements.

### Scholarships for Orphans

Their Majesties and the Members of the Royal Family granted scholarships to children in all six provinces, whose prospects for life were in jeopardy upon the loss of parents or guardians. As an immediate measure to foster those children's education, so as to enable them to earn qualifications and enter into occupational careers, the Thai Red Cross Society under Royal Patronage was entrusted with an endowment of 70 million baht (approximate equivalents US\$1.75 million or €1.4 million).<sup>199</sup>

### Livelihood

Foundation and framework for the rehabilitation of victims' livelihood have been encapsulated in royal advice on ways and means to achieve sufficiency and ensure sustainability. Strong emphasis has been placed on the resurrection of fishery as the single-most important source of sustenance and cash earnings. Due recognition has been given to agriculture as a vital, complementary source of livelihood. The obvious potential for employment creation and supplementary income generation has been tapped through the promotion of crafts.



### Ways & Means to Achieve Sufficiency and Sustainability

The Office of the Chaipattana Foundation under Royal Patronage helped ease hardship faced by tsunami victims in six provinces by restoring and developing the disaster-stricken areas. In accordance with H.M. the King's philosophy, all supportive initiatives should be coherent with the varied aspects of the particular socio-cultural environment and the needs of the people. Strong emphasis was placed on the mandatory adherence to the royal directives for villagers to be guided by the principles of sufficiency and sustainability.<sup>200</sup>



<sup>199</sup> The Thai Red Cross Society. FRAMEWORK.

<sup>200</sup> "The Royal Benevolence Wiped Away Tears." By Onanan Woothisen. Translated by Suleeporn Bunbongkarn. The Chaipattana Foundation Journal, August 2005, pp. 31-35.

Disaster victims who desired to be resettled, for example at Ban Thung Rak, Mae Nang Khao Sub-district, Khura Buri District, situated inside a forest reserve, committed themselves to adopt the attitude of “People in Communion with the Forest” (“*Khon Yu Ruam Kab Pa*”) so as to live harmoniously with the surrounding forest by adhering to His Majesty’s philosophy and obeying to inherent royal advice, while they continue to earn their living through fishing in the sea. To sustain their source of livelihood, the members of the new fishing community are admonished to learn about the significance of mangrove forests as breeding and hatching grounds of aquatic life, and enhance the general awareness of the vital importance of life cycles in the immediate surroundings of their new settlement as part of the natural habitat.<sup>201</sup>

district, Suksamran District, Ranong Province, a woman had lodged an appeal upon rejection of her request to be compensated for the loss of her only boat. The reason was that the lost boat, valued at around 15,000 baht, had been used to ship firewood. This did not meet the criteria applied by the Department of Fisheries. Thereupon, the Office of the Chaipattana Foundation granted financial assistance, to enable that woman to continue earning her living in the way she used to do.<sup>203</sup>



Royal vision has been focused on the uplifting of the quality of life of these newly settled people and offering them a better education than had been available before disaster struck. Availing of this opportunity would open access to occupational and professional careers for them to pursue. Heightened environmental awareness and prudent use of natural resources would enable them to fulfill these objectives, conducting their affairs with sustainable contentment, in spirit and deed.<sup>202</sup>



At Ban Hat Sai Khao, Na Da Sub-

<sup>201</sup> “The Chaipattana Foundation’s Post-Tsunami Housing Project.” *The Chaipattana Foundation Journal*, August 2005, pp. 31-35+39.

<sup>202</sup> “The Royal Benevolence Wiped Away Tears.” By Onanan Woothisen. Translated by Suleeporn Bunbongkarn. *The Chaipattana Foundation Journal*, August 2005, pp. 32-33.

<sup>203</sup> “Financial Support for Residents in Ranong Province.” *The Chaipattana Foundation Journal*, August 2005, p. 63.



## Fishery

A great number of the local residents, whose lives have depended upon fishing, lost their boats, gear and homes, leaving them unable to carry on earning their living. The Chaipattana Foundation has been seeking ways and means to help so as to alleviate hardship, at the earliest. One of the urgent tasks has been to replace the lost, destroyed or damaged fishing boats.<sup>204</sup>

To support fishery, the Office of the Chaipattana Foundation has equipped the disaster-stricken fishing communities with the required gear, and offered their households some start-up funding and material for home-based manufacturing, provided they form specialized occupational groups. By setting up boat finance management groups, fishermen have become eligible for loans earmarked for boat maintenance and occupational development through training members on how to manage the groups' funds.

Emphasis has been placed on how to monitor expenditures, safeguard against incurring debts, and make savings to build an endowment. At the start-up, these groups were assigned to identify the households worst affected by the tsunami, which would be eligible for and given preference in granting financial support. The Bank for Agriculture and Agricultural Cooperatives and the Krung Thai Bank have been responsible for guidance and supervision of the groups' operations.<sup>205</sup>



<sup>204</sup> "The Chaipattana Foundation's Fiberglass Fishing Boat Project." *The Chaipattana Foundation Journal*, August 2005, pp. 44-46.

<sup>205</sup> "The Royal Benevolence Wiped Away Tears." By Onanan Woothisen. Translated by Suleeporn Bunbongkarn. / "The Chaipattana Foundation's Fiberglass Fishing Boat Project." *The Chaipattana Foundation Journal*, August 2005, pp. 31-35 / 44-46.

To provide the affected fishing communities with a more durable alternative to wood, which had been used in building traditional, small boats known as dories, the Chaipattana Foundation funded and the Thai Red Cross Society commissioned the building of fishing boats using fibreglass as construction material. The Department of Fisheries, the Naval Dockyard Department and the Ayutthaya Ship Building College joined hands to build two prototypes of ten-metre long, fibreglass dories. They were named “Chaipattana – Thai Red Cross” boats and have been called *Hua Thong* (‘Golden Head’) by the locals. The boats were built by the Vocational College Thai Mueang, Phang-nga Province, and the Naval Dockyard Department, Bangkok. They were delivered, in turn, to each province where to test their usefulness and efficiency. After improvements and modifications were made to suit the natural conditions and fishermen’s capture requirements, the structural design of the boat was finalized.<sup>206</sup>



Some fishermen of Ban Nam Khem, Bang Muang Sub-district, Takua Pa District, Phang-nga Province, requested to take one prototype of a fibreglass boat out onto the sea for fishing. They returned and expressed satisfaction. The boat did not knock about as they had assumed. It also could carry a large catch of fish and, thus, brought good luck to their first fishing. In their opinion that boat was an

improvement over earlier fibreglass boats and might become widely acceptable among fishermen.<sup>207</sup>

On 24 June 2005, the first place to hand over four fibreglass boats was in the

<sup>206</sup> “The Royal Benevolence Wiped Away Tears.” By Onanan Woothisen. Translated by Suleeporn Bunbongkarn. / “The Chaipattana Foundation’s Fibreglass Fishing Boat Project.” *The Chaipattana Foundation Journal*, August 2005, pp. 31-35 / 44-46.

<sup>207</sup> “The Royal Benevolence Wiped Away Tears.” By Onanan Woothisen. Translated by Suleeporn Bunbongkarn. *The Chaipattana Foundation Journal*, August 2005, pp.31-35.

Sirinat National Park, therein at Hat Nai Yang, Phuket Province. Then, in the morning of the next day, twelve fiberglass boats were delivered at the Vocational College Thai Mueang to fishermen from Ban Nam Khem, Bang Muang Sub-district, Takua Pa District, Phang-nga Province. In the afternoon of the same day, ten more boats were handed to fishermen at Ban Thung Nang Dam, Khura Sub-district, Khura Buri District, Phang-nga Province. On 26 June 2005, six fiberglass boats were given to fishermen from the islands of Hat Sai Dam and Sin Hai as well as from Ban Bang Ben at the pier of Phayam Island in the Phayam Archipelago National Park, Phayam Sub-district, Mueang District, Ranong Province. Also, the fishermen received assorted saplings with which to replant their cropping fields, including hevea or para rubber, lemon, bergamot, and various vegetables.<sup>208</sup> Before the end of July, more dories built of fibreglass were handed over to fishermen in the provinces of Krabi, Trang and Satun.<sup>209</sup>

On 4 June 2005, the Chaipattana Foundation presented some working capital to help the community shop on Sarai Island, Ko Sarai Sub-district, Mueang District, Satun Province, which had been affected by the tsunami. Working capital in the amount of 100,000 baht was given as an interest-free loan. It was split



into two equal components. One part was earmarked for the stocking-up with general commodities, and the other for the purchase of boat-engine fuel. With 29 members, this community shop has been operating for almost two years. All net income has been disbursed as dividend to members. The shop has been expanded to provide necessary albeit expensive items required by fishing communities such as boat-paint, draft nets and boat fuel.<sup>210</sup>

At the Ban Hin Lat Shelter, Khura Sub-district, Khura Buri District, Phang-nga Province, a woman survivor requested fishing gear. She was granted six fish containers made of fibreglass, each of 100-litre capacity, two scales for weighing up to 15 kilograms each, as well as a sum of 5,000 baht.<sup>211</sup>

<sup>208</sup> The Chaipattana Foundation Journal, August 2005, p. 59.

<sup>209</sup> "The Chaipattana Foundation's Fiberglass Fishing Boat Project."

The Chaipattana Foundation Journal, August 2005, pp. 44-46.

<sup>210</sup> "Working Capital for Community Shop." The Chaipattana Foundation Journal, August 2005, p.64.

<sup>211</sup> "Granted Help to the Family of Mrs. Petch Mitnoi." The Chaipattana Foundation Journal, August 2005, p. 65.



## Agriculture

On 32 hectares of land provided for farmers by the Chaipattana Foundation in Mae Nang Khao Sub-district, Khura Buri District, houses were built for 120 farm households. In the same district, another 32 farm households were settled in houses on a plot of one hectare in Khura Sub-district. Members of these households received training on the harvesting and peeling of cashew nuts, and were equipped with a mechanical peeler, an oven, as well as start-up capital. Training on food processing was started with the preparation of crisp biscuits made of rice and fish. The Foundation took charge of marketing the said products.<sup>212</sup>

The Chaipattana Foundation sent an environmental expert to inspect the area devastated by the Tsunami on Sukon Island, Palian District, Trang Province, to seek ways to recondition the soil quality in the agricultural area, consisting of rice fields and watermelon orchards, which had deteriorated under the tsunami impact. While most islanders had earned their living by fishing, some had grown para-rubber trees, rice or watermelons. Agricultural lands totalling 160 hectares had been inundated by the giant wave. The soil of altogether 32 hectares of paddy land and watermelon fields

had absorbed seawater to the extent of becoming saline. To decontaminate the soil, the digging of a tideway through the paddy land and of a pond near the shore was recommended to drain off water and thereby flush out salinity into the sea, after each rainfall. In this manner, the soil condition has gradually been improved to facilitate the growing of crops.<sup>213</sup>

At Ban Bo Chet Luk, La-ngu Sub-district, La-ngu District, Satun Province, most residents have earned their living through fishery, supplemented by growing watermelons as well as cucumbers and rearing cattle. The Tsunami did not only wreck havoc on fishery but also damaged cropping fields and pasture. Moreover, the groundwater sources had deteriorated. Rehabilitation has been a complex challenge, involving the protection from shore erosion triggered by the tsunami, the building of a dike, and the planting of casuarinas to reinforce the shore and reduce erosion caused by wind.<sup>214</sup>

## Crafts

Apart from fishing, occupations such as the processing of fish, meshing of fishing nets, and manufacturing of batik cloth, as well as producing all-purpose cleaning solutions and crafting trinkets from lobster shells have been promoted to generate additional income.<sup>215</sup>

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<sup>212</sup> Phang-nga Tsunami, p. 19.

<sup>213</sup> "The Royal Benevolence Wiped Away Tears." By Onanan Woothisen. Translated by Suleeporn Bunbongkarn / "The Chaipattana Foundation's Consultant Suggesting Ways to Improve Soil Quality Deteriorated by the Destructive Wave". The Chaipattana Foundation Journal, August 2005, pp. 31-32+34 / 60-62.

<sup>214</sup> "Suggesting Ways to Improve Soil Quality Deteriorated by the Destructive Wave." The Chaipattana Foundation Journal, August 2005, pp. 60-62.

<sup>215</sup> "The Royal Benevolence Wiped Away Tears." By Onanan Woothisen. Translated by Suleeporn Bunbongkarn. The Chaipattana Foundation Journal, August 2005, pp. 31-35.



### Reconstruction of the Built Environment

Plans were drawn up for new settlements, and the construction of houses complete with infrastructure development has progressed. The communication, transportation and utility networks as well as links of some old settlements, laid to waste under the impact of the tsunami, have been restored. Survivors' households opting for resettlement have moved into their new homesteads, while others returned to their old, repaired locations.

### Housing

In some cases reported from Khura Sub-district, Khura Buri District, there not only were people whose houses had been destroyed but also people who did not want to continue to live in the location devastated by the tsunami. Upon advice by Their Majesties and the Royal Family, the Chaipattana Foundation purchased land on which settlements were built. In grateful recognition of the

support granted by the organizations involved they have been named "Chaipattana – Thai Red Cross – World Vision Villages" ("*Ban Bang Wa*").<sup>216</sup>

These villages have provided housing for people made homeless and evacuated from the island of Phra Thong, identical with Ko Phra Thong Sub-district, Khura Buri District, as well as for villagers of Ban Nam Khem, Bang Muang Sub-district, Takua Pa District, whose houses had been destroyed. They all had been put up in temporary shelters and opted for relocation. At Ban Thung Rak, Mae Nang Khao Sub-district, Khura Buri District, situated inside a forest reserve and on the banks of a creek which empties into the sea, the Ministry of Natural Resource and Environment selected a suitable plot.<sup>217</sup>

To alleviate hardship upon damage that made houses inhabitable, such as at Ban Hin Lat, Khura Sub-district, Khura Buri District, Phang-nga Province, financial help was granted to enable victims to purchase material required for repair.<sup>218</sup>

<sup>216</sup> "The Royal Benevolence Wiped Away Tears." By Onanan Woothisen. Translated by Suleeporn Bunbongkarn. The Chaipattana Foundation Journal, August 2005, pp. 32-33.  
<sup>217</sup> "The Chaipattana Foundation's Post-Tsunami Housing Project." The Chaipattana Foundation Journal, August 2005, pp. 31-35+39.  
<sup>218</sup> "Granted Help to the Family of Mrs. Petch Mitnoi." The Chaipattana Foundation Journal, August 2005, p. 65.



## Infrastructure

The physical plan of any newly established settlements for devastated fishing communities named “Chaipattana – Thai Red Cross Village”, such as at Ban Thung Rak in a forest by a creek, was laid out complete with housing for one hundred or more families, a child development centre, a school, a health centre, public utility systems of water and electricity supply, solid waste disposal and wastewater treatment facilities, connecting roads and a pier. Typically, these settlements have been examples of reconstruction through joint ventures by the Royal Thai Armed Forces such as the Engineering Department of the Royal Thai Army, certain private-sector enterprises such as the Desktop Company Ltd., and the Thai Red Cross Society.<sup>219</sup>

To several other locations, altogether 500 storage tanks holding 2,000 litres each were delivered. Once installed and filled with freshwater, one such tank supplied three to four households. Those tanks were provided by the Siam Cement Pcl.<sup>220</sup>

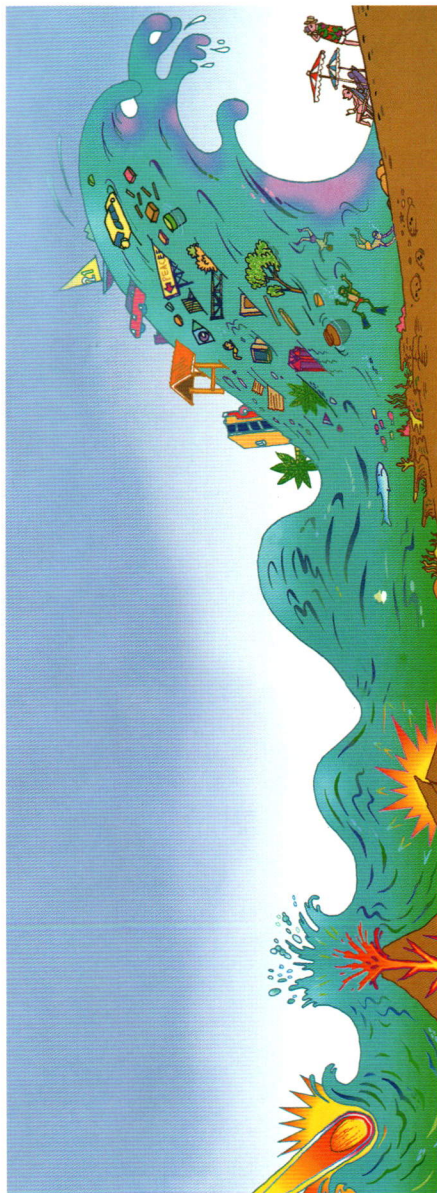


<sup>219</sup> “The Chaipattana Foundation’s Post-Tsunami Housing Project.” *The Chaipattana Foundation Journal*, August 2005, pp. 31-35+39.

<sup>220</sup> “The Royal Benevolence Wiped Away Tears.” By Onanan Woothisen. Translated by Suleeporn Bunbongkarn. *The Chaipattana Foundation Journal*, August 2005, pp. 31-35.

## Enhancing Disaster Awareness and Preparedness

Upon advice by Their Majesties and the Royal Family, the Chaipattana Foundation undertook to have an easy-to-read cartoon book titled “Tsunami Warning” translated. It was published by the Chaipattana Foundation under the title of “*Rabob Tuean Phai Suenami*”.<sup>221</sup> This cartoon book is meant to disseminate information about what causes a tsunami and how it rises, to raise readers’ awareness of natural portents of a tsunami, and to specify precautions so as to prevent any loss of life. The Foundation had also a poster printed drawing public attention to the “Tsunami: Giant and Destructive Waves” in cartoon style. The poster entitled “*Khluen Yak Khluen Mahaphai Suenami*” depicts how the wave occurs and what should be done to save lives.<sup>222</sup>



<sup>221</sup> Tsunami Warning. Designed and written by George Pararas-Carayannis, Patricia Wilson, and Richard Sillcox, with illustrations by Joe Hunt. Web version scanned and assembled by David Gronbeck-Jones. Victoria, B.C. : British Columbia Provincial Emergency Programme / Ocean Institute of Canada. Funded by UNESCO. (n.d.)

<sup>222</sup> “A Thai Version of the Cartoon Book “Tsunami Warning”.” The Chaipattana Foundation Journal, August 2005, p. 66.

REHABILITATION THROUGH THE  
THAI RED CROSS SOCIETY  
UNDER ROYAL PATRONAGE

Of greatest concern has been the alleviation of hardship to long-term, salutary effect. Among the urgent requirements which have been fulfilled are support for orphans, restoration of livelihood, school education, and housing as well as rehabilitation of the infrastructure.

### Support for Orphans

To meet needs of greatest urgency in Phang-nga Province, several orphans were awarded scholarships worth 240,000 baht, in total.<sup>223</sup>

### Livelihood

The economic mainstay of the affected population having been fishery, assistance has been focused on enabling the affected fishing communities to carry on earning their living. This has been supplemented by the promotion of crafts for employment creation and additional income generation.<sup>224</sup>

### Fishery

Fishing communities along the coast of Ranong, Phang-nga and Phuket provinces, which had been worst hit by the brute force of the tsunami, were left almost without boats. Given the urgency of enabling fishermen to earn their living, the demand for boats by far



exceeded supply. On the initiative of the Chaipattana Foundation and the Thai Red Cross Society, a project was launched to equip fishing communities with boats built of fiberglass at a unit cost of 150,000 baht. Fishing communities in Krabi Province received 50 fishing boats, built of wood at a total cost of 15 million baht. Fishing communities in Khura Buri District of Phang-nga Province were given fishing gear worth 9.3 million baht. Disaster victims in fishing communities of Pa Khlok and Saku sub-districts in Phuket Province received fishing gear worth 600,000 baht. In Laem Son sub-district, La-ngu District of Satun Province, 72 fishery households were given white bass fingerlings for rearing in hinged, floating cages. This input was worth 360,000 baht. In Thung Wa



<sup>223</sup> The Thai Red Cross Society. FRAMEWORK.

<sup>224</sup> The Thai Red Cross Society. FRAMEWORK.

Sub-district, Thung Wa District of the same province, 86 fishery households were given white bass fingerlings for rearing using the same technique, as well as fishing gear, at a total value of 700,000 baht.

### Crafts

Families of soldiers serving in the Royal Thai Navy who were affected by the tsunami received sewing machines and related equipment. Women among Phuket's disaster victims in need of assistance received funds and equipment for the manufacturing of products using local raw materials. Carpentry tools required for boat and house repair worth 400,000 baht were given to disaster victims in Satun Province.

### School Education

Children were among the worst affected surviving victims in the aftermath of the disaster. Those of schooling-age have been taken care of by providing nutrition through lunching at school, once buildings have been repaired, or new buildings have been constructed, as it were. Moreover, essential facilities and certain necessities have been provided.<sup>225</sup>

### Nutrition

School lunch was subsidized with 1.3 million baht in Phuket Province and 270,000 baht in Trang Province. Support of child education in Satun Province included a lunch programme for school children at a total cost of 380,000 baht.

### Repair of Buildings

To repair damage inflicted by the tsunami on two schools located on Ko Lau Island, Ngao Sub-District, and Hin Chang Island, Ko Phayam Sub-district, both of Mueang District, Ranong Province, a budget of five million baht was allocated. Repair costs for the school playground at Ban Bo Chet Luk, La-ngu Sub-district, La-ngu District amounted to 100,000 baht.

### Construction of Buildings

In Bang Niang Sub-district, Takua Pa District, Phang-nga Province, a Child Centre was built. The construction cost amounted to 4.5 million baht. With funding support amounting to 1.6 million baht, a child development centre was built at Ban Hat Sai Thong of Trang Province. Several buildings and facilities were constructed in Satun Province. The cost of constructing the buildings of the school in Ban Thung Wa Sub-district, Thung Wa District amounted to 15 million



<sup>225</sup> The Thai Red Cross Society. FRAMEWORK.

baht. Child development centres were constructed in four locations. The one in the Ban Thung Bu Lang Sub-district, Thung Wa District, is worth 4.7 million baht, and the cost of another such centre in the same district amounted to 4.5 million baht. The centre at Ban Pak Bara, Pak Nam Sub-district, La-ngu District was funded with 4.44 million baht. The initial development stage of another child centre in Kamphaeng Sub-district, La-ngu District required 1.22 million baht.

### Facilities and Necessities

To ensure clean water supply to ten schools on the island of Phuket, water treatment systems were installed at a total cost of 1.25 million baht. Likewise, in the provinces of Trang and Satun, water tanks were built worth a total of 540,000 baht.

School-age children in locations struck by disaster were given the required student uniforms. The cost defrayed in Ranong Province amounted to one million baht and in Trang province to 500,000 baht. Also covered by the said funds was the purchase of computers for schools in Ranong and Trang provinces. Some schools in Trang Province also received funding to repair school kitchens.

The physical set-up of six schools in Phuket Province was improved by adding playgrounds, at a total cost of 1.1 million baht. The sum of 60,000 baht was spent on playground installations at two child centers in La-ngu District of Satun Province.

## Housing & Infrastructure Rehabilitation<sup>226</sup>

To meet urgent demand in Khura Buri District, Phang-nga Province, temporary houses were built, at a cost of 1.7 million baht, in the area surrounding the monastery of Wat Pa Suan. In the neighbouring district of Takua Pa the “Phru Tiao Red Cross Village” was built, worth 9.6 million baht.

In Ranong Province, examples of reconstruction include an all-purpose building worth 600,000 baht at Ban Thale Nok, Muang Kluang Sub-district, Kapoe District; and a water supply system worth 3.85 million baht for Bang Se Me, Bang Hin Sub-district, Kapoe District.

Water supply structures built in Satun Province included 250 tanks with a capacity of 5,000 litres each, at a total cost of 2.1 million baht, to substitute for wells contaminated by seawater in Thung Wa Sub-District, Thung Wa District, and large-size water reservoir worth 1.2 million baht.

The construction of a pier at Ban Bu Boi, Laem Son Sub-district, La-ngu District, Satun Province, was supported with funding in the amount of 2 million baht.



<sup>226</sup> The Thai Red Cross Society. FRAMEWORK.

The challenge faced has been exceedingly complex and of great urgency. Given the sheer number of surviving and homeless victims, the construction of housing units has been of high priority. In order to get children back to school, ensure that religious services be conducted, and get jobless adults back to work, employment opportunities have been created and massive infrastructure rehabilitation has been launched.<sup>227</sup> The first phase of reconstruction and restoration has been shouldered, to a large extent, by the Royal Thai Armed Forces. To facilitate the rehabilitation of the livelihood of fishing communities, appropriate technology has been applied to the building of fishing boats. Special care has been taken of those disaster victims in need of mental rehabilitation. The restoration of the natural marine environment has been pursued along with taking precautions against the recurrence of loss of life through maritime natural disasters. Cases of the well documented rehabilitation measures implemented by governmental line agencies in two affected provinces, namely, Phang-nga and Phuket, signify accomplishments.

Reconstruction and Restoration  
by the Royal Thai Armed Forces

The construction of permanent housing by the Royal Thai Armed Forces on

behalf of the Government resulted in the building of 1,491 units at a total cost of 208.74 million baht (approximate equivalents US\$5.2 million or €4.1 million) in the provinces of Ranong, Phang-nga, Phuket, and Krabi.<sup>228</sup>

The construction of other settlements such as “Chaipattana – Thai Red Cross – World Vision Villages” (“*Ban Bang Wa*”) was done through joint ventures of the Royal Thai Armed Forces and private-sector enterprises. Construction of one of these new villages was supported by the Desktop Company Ltd. as the partner in charge of drawing up the physical plan. The project was executed by the Engineering Department of the Royal Thai Army. It was completed in August, 2005.<sup>229</sup>

The Royal Thai Navy, through the Hydrographic Department, has partnered the Asian Disaster Preparedness Center (ADPC) in establishing a station, as component of the Tsunami Early Warning System, to digitally gauge the sea-water level around Miang Island in the Similan Archipelago, Phang-nga Province. This station is linked to the seismic monitoring station of the Royal Thai Armed Forces in Chiang Mai Province.

In cooperation with private-sector associations, foundations, sports organizations, and religious communities, the Royal Thai Armed Forces have boosted the morale of surviving victims and

<sup>227</sup> Tsunami on Phuket, p. 24.

<sup>228</sup> “Defence. Missions and roles of the Royal Thai Armed Forces ๖”. Draft paper . Thailand in the 2000’s. (in preparation) Bangkok, (2005). First version, pp. 8-11.

<sup>229</sup> “The Royal Benevolence Wiped Away Tears.” By Onanan Woothisen. Translated by Suleeporn Bunbongkarn. The Chaipattana Foundation Journal, August 2005, pp.32-33.





fostered compassion throughout the disaster area. To collect debris and rubble at the bottom of the ocean, with emphasis on restoring coral reefs and clusters of sea fans, the Supreme Command Headquarters together with Thai Airways International Pcl. and the UBC Corporation, assisted by other public-sector as well as private-sector bodies, planned the event called “Preserve the Andaman Day”, which was held on 5 March 2005.<sup>230</sup>

### Infrastructure

The first step taken in each of the six affected provinces was to ensure clean freshwater supply. Sources of water used prior to the tsunami had been destroyed, supply pipes disrupted, wells had been blocked up or swamped with sediments and contaminated, or inundated with seawater. They, thus, became saline and unfit for human consumption. Water sources infiltrated with seawater were rehabilitated, and reservoirs as well as tanks repaired and filled with freshwater. In some places such as on Muk Island,

Bang Sak Sub-district, Kantang District of Trang Province an artesian well was drilled to tap an aquifer and, thereupon, a water-pipe supply system was installed. This particular project was implemented by the Center of Groundwater Resources Region 5.<sup>231</sup>

### Appropriate Technology : Boat Building

Replacing some 3,000 lost fishing boats, including trawlers and dories, posed a major challenge in efforts to rehabilitate the livelihood of fishing communities. The Chaipattana Foundation under Royal Patronage initiated a project to build dories, small boats, by using fibreglass instead of wood. The Ayutthaya Ship Building College developed the prototype of a fibreglass boat which is sized and shaped like the traditional dory used for fishing in the shallow reaches of the Andaman Sea.<sup>232</sup>

The Department of Fisheries, the Naval Dockyard Department and the Ayutthaya Ship Building College joined hands, acting on the advice of the

<sup>230</sup> “Defence. Missions and roles of the Royal Thai Armed Forces”. Draft paper. Thailand in the 2000’s. (in preparation) Bangkok, (2005). First version, pp. 8-11 / Enlarged version, pp. 12-15.

<sup>231</sup> “The Royal Benevolence Wiped Away Tears.” By Onanan Woothisen. Translated by Suleeporn Bunbongkarn. The Chaipattana Foundation Journal, August 2005, pp. 31-35

<sup>232</sup> “The Royal Benevolence Wiped Away Tears.” By Onanan Woothisen. Translated by Suleeporn Bunbongkarn. The Chaipattana Foundation Journal, August 2005, pp. 31-35

Chaipattana Foundation, and commissioned by the Thai Red Cross Society, to design, develop and build 60 ten-metre long, fibreglass fishing boats. The testing of two prototype fibreglass boats named “Chaipattana – Thai Red Cross”, one built by the Naval Dockyard Department and another one at the Vocational College Thai Mueang, Phang-nga Province, under instruction and supervision by the Ayutthaya Ship Building College, proved successful. Thereupon, the Office of the Vocational Education Committee was advised to introduce a course on boat-building using fibreglass at various colleges, in order to train professionals qualified in design, construction, repair, and maintenance, in order to meet future demand.<sup>233</sup>

Another 500 boats were built of fibreglass by inmates of prisons in Phang-nga Province, who had been trained by the Ayutthaya Ship Building College and the Department of Fisheries, at the Thai Mueang Vocational College. By the end of October 2005, these boats were finished and delivered to those fishermen who held an option.<sup>234</sup>

The fibreglass boat is tough, durable, and requires little maintenance which incurs low cost. To caulk the hulls or remove shipworms from wooden boats would cost more than 10,000 baht per year, whereas the maintenance cost of a fibreglass boat is only 2,000 baht annually. If a wooden boat were built of the rare Hopea wood, it would be much more expensive than a fibreglass boat, which costs only 120,000 baht. If it were made of other kinds of wood, a boat would cost 90,000 baht. Its quality and durability would be inferior, indeed, to those of a fibreglass boat.<sup>235</sup>

The use of fibreglass fishing boats will be monitored and instructions on maintenance disseminated. To manage the disposal of old and unusable fibreglass boats, their material will be used in road building or as inert material submerged into the sea, for corals to cling on, form colonies, and eventually build reefs.<sup>236</sup>



<sup>233</sup> “The Royal Benevolence Wiped Away Tears.” By Onanan Woothisen. Translated by Suleeporn Bunbongkarn / “The Chaipattana Foundation’s Fibreglass Fishing Boat Project.” *The Chaipattana Foundation Journal*, August 2005, pp. 31-35 / 44-46.

<sup>234</sup> “The Chaipattana Foundation’s Fibreglass Fishing Boat Project.” *The Chaipattana Foundation Journal*, August 2005, pp. 44-46+59.

<sup>235</sup> “The Royal Benevolence Wiped Away Tears.” By Onanan Woothisen. Translated by Suleeporn Bunbongkarn. *The Chaipattana Foundation Journal*, August 2005, pp. 31-35

<sup>236</sup> “The Chaipattana Foundation’s Fibreglass Fishing Boat Project.” *The Chaipattana Foundation Journal*, August 2005, pp. 44-46.

## Livelihood

Support has been concentrated on the three major economic sectors of fishery, agriculture, and tourism as well as hospitality industry. For many households, for virtually all small and medium-scale enterprises, and for the flagship enterprises in the tourism and hospitality industry, these three economic sectors have been vital pillars.

### Fishery

In support of the revitalization of fishery, largely through the supply of fishing boats, the Department of Corrections has assigned inmates of prisons in Takua Pa District and other districts of Phang-nga Province to undergo skill training on boat-building using fibreglass. This also has been an opportunity for inmates to help tsunami victims. Moreover, it has enabled them to acquire a vocational skill of practical use, once they will have served their term.<sup>237</sup>

### Agriculture

Seeds of various kinds of vegetables were offered to growers in Phang-nga Province. All sorts of seeds together weighed 182 kilograms and were distributed by the Department of Agricultural Extension, Ministry of Agriculture and Cooperatives.<sup>238</sup>

## Tourism & Hospitality Industry

Enterprises in need of venture capital to restart or rehabilitate their business received soft loans at 2% p.a. interest rate, drawn from the Social Security Fund, to the total amount of five billion baht. Individual loans must not exceed 40 million baht. Seven finance institutes have participated in this rehabilitation project.<sup>239</sup>

### Mental Rehabilitation for Disaster Victims

Among the survivors are the unfortunate ones who lost persons dear to their heart. Many adult survivors lost their spouse, children, one or both parents, or grandchildren. Many children lost mother or father, one or more siblings, or their grand-parents. The death of thousands of people deprived a larger number of survivors of their relatives or close friends. Many survivors will remain grief-stricken for life. Among those who survived after recovering from injury are persons who will remain physically disadvantaged for life. Many more will struggle to cope with mourning their loss, healing their trauma, balancing their emotions, and finding spiritual peace.

Into the future, mental rehabilitation will be required. Traumatized disaster survivors remain in need of therapy and counseling until they will regain the mental capability and emotional strength to face the challenges of ordinary life.

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<sup>237</sup> "The Royal Benevolence Wiped Away Tears." By Onanan Woothisen. Translated by Suleeporn Bunbongkarn. *The Chaipattana Foundation Journal*, August 2005, pp. 31-35.

<sup>238</sup> *Phan-nga Tsunami*, p. 19.

<sup>239</sup> *Phang-nga Tsunami*, p. 44.

Findings of a survey conducted in cooperation with and published by the United Nations Children's Educational Fund (UNICEF) and the World Health Organization (WHO) showed that 50 percent of surviving disaster victims have been in need of mental health care such as psychiatric treatment, while others needed counseling and follow-up care. Into the future, any disaster victims diagnosed to have mental problems will have to be taken care of by psychiatrists and treated accordingly.<sup>240</sup>

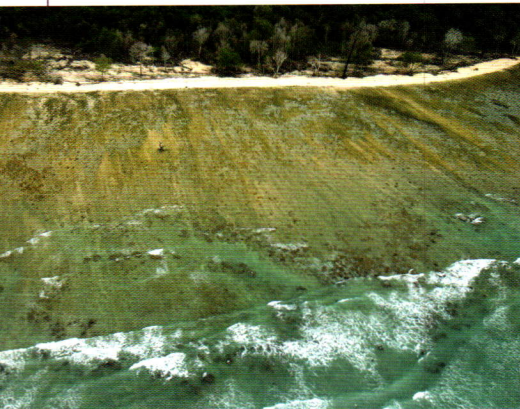
### Restoration of the Natural Marine Environment

To rehabilitate the ruined mangrove forests, the Department of Marine and Coastal Resources prepared the ground for replanting. This first step was completed in April, 2005. The replanting proper has started in November, 2005. For the planting of one hectare of mudflat some 4,400 saplings are required. The coastal areas

earmarked for replanting cover 1,472 hectares, in total. Hence, about 6.5 million saplings are required to restore vital mangrove forests.<sup>241</sup>

### Precautions Supported by the Ministry of Foreign Affairs

As a means to prevent a repeat of the devastation that occurred, the Ministry of Foreign Affairs participated in a Special ASEAN Leaders' Meeting held in Indonesia. On that occasion, the governments of member countries welcomed Thailand's proposal to establish an early warning system to safeguard, in the event of a re-occurrence of such catastrophic incident, against any future disastrous impact. It was also resolved to organize a follow-up meeting, to be convened in Thailand.



<sup>240</sup> Tsunami Phuket, pp. 63+65.

<sup>241</sup> Phang-ngaTsunami, p. 51.



On 28-29 January 2005, the Ministry of Foreign Affairs together with the Ministry of Information and Communication Technology jointly hosted the Ministerial Meeting on Regional Cooperation on Tsunami Early Warning Arrangements, convened in Phuket, as a follow-up to the Special ASEAN Leaders' Meeting held in Indonesia. The participating government representatives concurred on the need to establish a regional early warning system as soon as possible that would be working under the umbrella of the United Nations. This meeting was concluded with the adoption of the Phuket Ministerial Declaration on Regional Cooperation on Tsunami Early Warning Arrangements.<sup>242</sup>

Rehabilitation Implemented by the Phang-nga Provincial Administration

Fishery has been the economic mainstay of the population-at-large in coastal

settlements. The rehabilitation of its various components is addressed in preceding sections and paragraphs. Other aspects include the heightening of disaster awareness and preparedness, agriculture, crafts, infrastructure, and livelihood.

**Heightening Disaster Awareness and Preparedness**

The Provincial Public Health Office published brochures to inform and educate the population in disaster areas about how to react to the sudden, calamitous challenges, to regain emotional strength, to focus mental powers, and to rebuild resilience. One brochure entitled "In the Event of Disasters" ("*Muea Prasobphai*") offers advice on how to carry on with life. Another brochure entitled "Taking Precautions by Oneself" ("*Kan Dulae Ton Aeng*") guides the readers how to heal emotional wounds

<sup>242</sup> Summary of the Measures Implemented by the Ministry of Foreign Affairs of Thailand in the Aftermath of the Tsunami Devastation. Bangkok, (2005). Items # 9 & 10.

and regain peace of mind. The contents of these documents are also available in the electronic medium of a website. A training course on the subject of “Mental Health Support for Disaster Victims” (“*Kan Chuailuea Thang Chitchai Kae Prasobphai*”) was developed and has been delivered by professionals to victims at locations devastated by the tsunami.<sup>243</sup>

### Agriculture

The start-up of rehabilitation in the agricultural sector was facilitated through relief in monetary terms. Farmers whose cropping fields, orchards, or plantations had been devastated, received the equivalent of ten percent of the production output of their lost cropping enterprises. The total amount of 4.42 million baht was meant to facilitate soil improvement and crop planting. Most farmer beneficiaries (215) were in Takua Pa District, followed by the districts of Thai Mueang (83), Khura Buri (79), Ko Yao (11) and Takua Thung (5).<sup>244</sup>

Other constraints faced by farmers were eased on a case-by-case basis. A total of 106,851.52 baht (approximate equivalents US\$2,670 or €2,130) was disbursed to 18 farmers in Takua Pa District, and financial support totaling 474,628 baht (approximate equivalents US\$11,865 or €9,490) was given to 13 farmers in Khura Buri District.<sup>245</sup>

Rehabilitation of livestock production was launched as a long-term project. It has been started with the components of pasture, breeding stock, fodder, and know-how. Pasture rehabilitation after inundation with seawater, fertility improvement, and pasture expansion have been started in the districts of Khura Buri and Ko Yao. The provincial administration initiated and supported, with a start-up grant of one million baht, professional training on breeding and rearing stocks of buffaloes and goats. This venture supplements the government’s strategy for the nationwide promotion of beef cattle rearing by one million farm households. Also, training was planned on the production and storage of fodder.<sup>246</sup>

With support of the FAO and UNICEF the number of farms engaged in hydroponic vegetable growing was increased sharply. In addition to the pilot ventures operated by farm households in a newly built “Chaipattana Village”, another 100 basins were installed at farms in Thai Mueang District. The required funding of 5.117 million baht was provided by UNICEF.<sup>247</sup>

Across the five districts hit by the tsunami, soil in agricultural lands inundated by seawater needed to be rehabilitated. To restore soil fertility under the guidance of the Land Development Department, the provincial development strategy office allocated a budget of 1.32 million baht (approximate equivalents US\$33,000 or €26,400) for the purchase of gypsum to be used as a soil conditioner.<sup>248</sup>

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<sup>243</sup> Phang-nga Tsunami, p. 60.

<sup>244</sup> Phang-nga Tsunami, p. 17.

<sup>245</sup> Phang-nga Tsunami, p. 18.

<sup>246</sup> Phang-nga Tsunami, p. 31.

<sup>247</sup> Phang-nga Tsunami, pp. 21-22.

<sup>248</sup> Phang-nga Tsunami, p. 22.

In Takua Pa District, a Buddhist monk conducted training courses on handicrafts using coconut shells as raw material, operating a home-based bakery, and growing mushrooms.<sup>249</sup> A farmer housewives' group at Ban Thap Lamu, Lam Kaen Sub-district, Thai Mueang District, was given equipment for the production of sweets by the Rao Rak Prathet Thai ('We Love Thailand') Foundation.<sup>250</sup>

Training courses on the manufacturing of Batik cloth were conducted at 16 locations and on food processing at another 20 in Takua Pa District. Those programs were pilot ventures organized by the Provincial Labour Office.<sup>251</sup> A farmer housewives' group at Ban Thap Lamu of Lam Kaen Sub-district, Thai Mueang District, received support funding to the amount of 100,000 baht from the Lam Kaen Local Administrative Organization.<sup>252</sup>

### Infrastructure

Construction of two buildings in Lam Kaen Sub-district, Thai Mueang District, one for occupational training, the other for agricultural technology service and training, together worth 4.7 million baht, was funded by the Rao Rak Prathet Thai ('We Love Thailand') Foundation.<sup>253</sup>

Cognizant of widespread unemployment into the foreseeable future, while the tourism and hospitality as well as construction industries have been expected to steadily recover and increasingly hire staff, and considering that fishery will take time to be fully operational again, the line agencies of the Ministry of Labour and Social Welfare prioritized the six following projects for Phang-nga Province.

1. Employment of tsunami victims was declared the project of highest priority. Availing of a budget allocation of 51.818 million baht (approximate equivalents US\$1.3 million or €1.04 million) the target was to get 7,000 persons into employment. During the period from 15 January – 30 June 2005, the project exceeded its target by creating employment for 8,441 persons, at a total disbursement of 51,616,250 baht.

2. The mobile recruitment service project set the target of 9,800 cases, with a budget of 100,000 baht. Of 3,376 registered applicants, the project managed to identify 1,768 positions. As a result, only 686 persons were employed. Expenditure on this project amounted to 28,000 baht.

3. The mobile employment transfer project targeted 350 cases, for which a budget of 10,500 baht was allocated. For 595 registered applicants, the project identified 376 positions, of which 27 were filled. Expenditures incurred exceeded the budget by 4,415 baht.

<sup>249</sup> Phang-nga Tsunami, p. 20.

<sup>250</sup> Phang-nga Tsunami, p. 19.

<sup>251</sup> Phang-nga Tsunami, p. 19.

<sup>252</sup> Phang-nga Tsunami, p. 22.

<sup>253</sup> Phang-nga Tsunami, p. 22.

4. The occupation creation project targeted eight ventures for a total of 180 persons. A budget of 1,920,800 baht (approximate equivalents US\$48,000 or €38,000) was allocated. There was substantial success in all eight ventures, with 160 persons entering new occupations. Total expenditures amounted to 1.2 million baht.

5. The occupational training project for victims targeted eight ventures covering a total number of 1,407 persons, using a budget of 6,486,000 baht (approximate equivalents US\$162,000 or €130,000). Implementation covered three ventures with 2,929 participants, at the expense of 4,352,476.86 baht.

6. The support fund for the unemployed who had been in employment prior to the disaster amounted to 31,554,900 baht (approximate equivalents US\$ 790,000 or € 630,000). This amount was budgeted in anticipation of 3,627 persons with entitlement. Applications were received from 6,493 unemployed, formerly having worked with 33 enterprises. Among those applicants, 439 from 22 enterprises met the criteria, passed the screening and were awarded subsidies totalling 3,222,580 baht.<sup>254</sup>

#### Rehabilitation Implemented by the Phuket Provincial Administration

Reference is made to the provincial recovery plan, with its emphasis on the rehabilitation and further development

of the tourism industry, as well as its backward and forward linkages. Like in the other five province affected by the tsunami, efforts have been concentrated on reconstruction and livelihood rehabilitation.

#### Recovery Plan

The Phuket Provincial Administration drew up a recovery plan for areas affected by the tsunami. Its prime objective has been to implement projects designed to support the rehabilitation and development of the tourism industry and related business ventures. It also has covered the restoration of natural resources and, in as far as necessary, the corresponding infrastructure for the tapping of natural resources, e.g. of freshwater sources.<sup>255</sup>

#### Reconstruction & Livelihood

The start-up of reconstruction was helped by domestic and foreign organizations. For example, two public health centers were built, three schools repaired, local administration buildings reconstructed, and 79 permanent houses built, all these within two months after the disaster had struck.<sup>256</sup>

A portion of the 82.04 million baht, allocated by the Coordination of Disaster Victim Relief to the Six Provinces Centre, out of the grand total of 1,432.86 million baht from domestic and foreign donations, has been used for rehabilitation. Ventures funded include the construction of 79 permanent houses at a total cost of 35.12 million baht, repair of utilities and scholarships totaling 2.03 million baht, and a small and medium enterprise (SME) development project implemented in coordination with the German Government, which granted 22 million baht.<sup>257</sup>

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<sup>254</sup> Phang-nga Tsunami, pp. 42-43.

<sup>255</sup> Tsunami Phuket, p. 24

<sup>256</sup> Tsunami Phuket, p. 83.

<sup>257</sup> Tsunami Phuket, p. 83.



## TSUNAMI-RELATED INTERNATIONAL TECHNICAL ASSISTANCE

Based on the listing of Thailand's international partners, as of 10 November 2005, altogether 34 organizations provided tsunami-related assistance. In alphabetical order, these partners have been



Danida, Denmark  
Department of Human Services, Victoria, Australia  
Embassy of Italy, Bangkok  
Entraide et Solidarité  
FFEM – Fond Français pour l'Environnement Mondial  
France  
François-Xavier Bagnoud Fondation  
French NGO  
French Red Cross  
GTZ – German Technical Cooperation  
Heart Doctors  
IOM – International Organization for Migration  
International Federation of the Red Cross and Red Crescent Societies  
International Labour Organization  
Municipality of Issy-les-Moulineaux  
National Polytechnique Institute of Toulouse  
Office for Coordination of Humanitarian Affairs – OCHA  
PMU – Interlife  
RAID – French Police  
Solidarités  
Swiss Agency for Development and Cooperation – SDC  
Terre des Hommes – Italy  
UN OPS  
UNFAO / UNDP  
United Nation's Children's Fund  
United Nations Development Programme  
United Nations Educational, Scientific and Cultural Organization  
United Nations Population Fund  
United Nations Programme on HIV / AIDS – UNAIDS  
United States Agency for International Development  
World Bank  
World Food Programme  
World Health Organization  
World Vision.

## **REGIONAL AND NATIONAL END-TO-END EARLY WARNING SYSTEM FOR TSUNAMI AND OTHER NATURAL HAZARDS**

The physical impact of the tsunami that struck the shores of Asia and Africa on 26 December 2004, in terms of death, injury, loss, and damage, has remained manifest in societies of every corner of the region. In the year since, scars and reverberations have been felt throughout Thailand and across the Indian Ocean.

The reaction of the Royal Thai Government to the tsunami, to ensure that the loss and suffering on this scale should never recur, developed as rapidly as its humanitarian response. Just eleven days following the tsunami, on 6 January 2005 in Jakarta, the Royal Thai Government, participating in the Special ASEAN Leaders' Meeting on the Aftermath of the Earthquake and Tsunami, announced that Thailand would help to set up a regional tsunami early warning system, nominating the Asian Disaster Preparedness Center (ADPC) to lead and forge these efforts.



At the Ministerial Meeting on Regional Cooperation on Tsunami Early Warning Arrangements convened in Phuket on 29 January 2005, the Royal Thai Government pledged US\$10 million as seed money to set up a Voluntary Trust Fund to be administered by UN-ESCAP. The governments of other countries were encouraged to contribute to this endowment. Its funds would be used to establish and strengthen a regional multi-hazard early warning system to protect not only Thailand but also neighboring countries in the region. In the following months, several international meetings were held to push these plans forward, with UNESCO's Intergovernmental Oceanographic Commission (UNESCO/IOC) playing a central coordinating role in ongoing deliberations. However, in the First UNESCO/IOC International Coordination Meeting for the Development of a Tsunami Warning and Mitigation System for the Indian Ocean, held in Paris in March 2005, efforts being made to safeguard lives across the Indian Ocean soon began to eclipse the needs of smaller, yet equally at-risk regions. The needs of countries bordering the Andaman and South China Seas were soon waylaid by efforts to protect the countries that had borne and endured the greatest loss in terms of lives and damages.

The Royal Thai Government, working in close collaboration with the Asian Disaster Preparedness Center, took the initiative to develop a Regional End-to-End Multi-hazard Early Warning System for and in Southeast Asia. The system design, drawn up by regional and international experts in February 2005 to

provide advance warning and information on tsunamis, cyclones, tidal surges, floods, and other natural hazards (multi-hazard) was re-orientated to focus on the Southeast Asian region. It integrates the technical component of warning with knowledge of communicating risks and community response to warning, including disaster preparedness, mitigation, and prevention (end-to-end).

By the end of March 2005, the Royal Thai Government's ministries of Foreign Affairs and Information and Communication Technology, ADPC and UN-ESCAP hosted a meeting of Southeast Asian nations in Bangkok, attended by representatives from Cambodia, China, Lao PDR, Myanmar, the Philippines, Thailand, and Vietnam. At this meeting, ADPC received the unanimous support of the said nations to serve as the Regional End-to-End Tsunami and Multi-Hazard Early Warning Center, and to assist the development of national early warning capacities in Cambodia, Lao PDR, Myanmar, Thailand, and Vietnam, with the technological assistance and expertise of China and the Philippines. Singapore subsequently agreed to support this system that would protect the countries of the Lower Mekong Basin.

The Asian Disaster Preparedness Center, operating from its headquarters in Bangkok with twenty years experience in disaster management and mitigation across continental Asia and the Pacific, is the natural geographic hub of expertise appropriate to administer this system. Consolidating this wealth of expertise and experience, ADPC has facilitated the sustainable development of communities

through disaster reduction techniques that integrate technology with community participation. This approach has ensured the continuing success of ADPC's projects and programs throughout Asia, which has met worldwide recognition. ADPC's experience in early warning started from 1990 – 1993 with a project to enhance the Cyclone Early Warning System in 24 Asian and Pacific countries, followed by flood forecasting applications in countries of South and Southeast Asia, up to the present time.

Destructive tsunamis generated by tectonic or volcanic activity are, fortunately, exceedingly rare in the Indian Ocean region, but the bathymetric topography of the Andaman and South China Seas hide several potential tsunamigenic sources. The Manila trench to the east threatens Cambodia, Malaysia, Thailand, and Vietnam, including the Philippines, whereas the Sumatra trench, extending north from Indonesia through the Andaman and Nicobar Islands, threatens Malaysia, Myanmar, Thailand, and the surrounding nations of the Indian Ocean. Throughout the Andaman Sea, fault lines, under new stresses since December 2004, fan out from the Sumatra fault. Although unlikely to be sources of any tsunami at this time, they pose a future hazard to inhabited zones, should they become active. Volcanoes off the coasts of Vietnam and the Philippines provide further potential threats that have been considered in the system design.

The system design includes a network of digital broadband seismic stations that would provide real-time information on

the location and magnitude of seismic activity. A number of deep-ocean pressure sensors (DART buoys) would detect the early passage of a tsunami before it reaches shallow waters and causes destruction along the coast. A network of sea level gauges, strategically located in the maritime zones of Thailand, Myanmar, Vietnam, and the Philippines, within the Intergovernmental Oceanographic Commission's Global Sea Level Observing System (GLOSS), would confirm the existence or non-existence of tsunami waves following an earthquake, monitor its progress, estimate the severity of the hazard along the coast, and provide a basis for declaring the hazard over.



In the first phase of implementation, the system would have five tide gauges, including three along the coasts of the Andaman Sea, one in the Gulf of Thailand, and one in the South China Sea, complemented by five seismic stations to provide monitoring and warning capacities to the most-at-risk countries. As of December 2005, the first three tide gauges were installed near the Southern Coast of Thailand, and the Coco Island in Myanmar. By the end of May 2006, the installation of two more tide gauges, one near the Philippines and one in Vietnamese waters, will be completed.

The installation or upgrading of five seismic stations in Cambodia, Lao PDR, the Philippines, Thailand and Vietnam will be finished by May 2006, thus completing the first phase of the regional early warning system for the 5-6 countries.

Expansion of the monitoring and observation network will be undertaken in a phased manner. The completed system should provide a comprehensive network, enabling the dissemination of warning information with a lead-time of at least half an hour, in the event that destructive tsunami waves are generated. With the development of national warning dissemination systems and community preparedness and response plans, this would provide adequate time for the evacuation of at-risk populations.

The keystone to this system, though integral to its success, is not technology. Successive reports and assessments of the tsunami's impacts have identified the lack of warning and education and awareness about the hazard, and inadequate



community emergency plans as major contributors to the losses suffered. The Asian Disaster Preparedness Center, with its exemplary record of assisting communities and governments at all levels in developing their disaster management and response capacities, has the capacity to strengthen the said non-technological system components.

In Thailand, this process has already begun. The Royal Thai Government's Department of Disaster Prevention and Mitigation (DDPM) and ADPC have, with support from the United Nations Development Programme (UNDP), initiated a one year programme to train staff of relevant government agencies and members of communities in the six southern tsunami-affected provinces to prepare for and respond to any future disaster or emergency. It is expected that this program will be expanded across Thailand and replicated in Cambodia, Lao PDR, Myanmar, and Vietnam, given the support from several donor countries, such as Denmark, Sweden, Norway, the UK, and USA, some of which should be

on the way by December 2005, less than a year after the devastating Indian Ocean tsunami.

ADPC has worked closely with the Royal Thai Government in developing Thailand's disaster warning center and overall disaster management capacities, through the DDPM, since 2002. In 2005, in response to the tsunami, the Royal Thai Government established the National Disaster Warning Center (NDWC), located in Bangkok, which is working closely in partnership with ADPC to develop the technological aspects of Thailand's disaster response systems. The NDWC will develop and expand over the coming years to administer Thailand's monitoring of and response to potential disaster situations within Thailand's national borders. The NDWC was inaugurated on 30 May 2005. By 6 September 2005, a Memorandum of Understanding with the Asian Disaster Preparedness Center was put into effect. The NDWC and ADPC shall share information and resources in relevant endeavours, complementing each others' work by providing a check and reference for evaluation.

This joint venture is not unique. Acting through the implementation of the regional early warning system, ADPC shall be working closely with the respective governments and community institutions in the five participating countries to develop their warning dissemination and national disaster risk management capacities, initially focusing on vulnerable, high-risk areas, in particular coastal communities. The inclusion of other natural hazards into the warning

system encourages the development and strengthening of capacities across the countries, beyond the coastal zones at immediate risk. To assist this endeavour, the Mekong River Commission (MRC), of which all participating countries in the regional early warning system are active members, will provide a pre-existing platform for action and dialogue on issues beyond these coastal zones. The Asian Institute of Technology, another close partner, has provided strong and consistent technical and research support to ADPC from the beginning.

By closely integrating the utilization of technology with the active participation of government authorities at the national, provincial, and local levels, alongside the communities, the early warning system framework provides a flexible, effective, and appropriate system that develops and evolves with national and local requirements.



Due to the rare occurrence of any basin-wide tsunami in the Indian Ocean, a system based solely on detecting tsunami is financially not sustainable beyond a few years. The future financial and material sustainability of the system has been assured through the active and future full participation of all countries in the system, and the establishment of the Voluntary Trust Fund, the principal source of funding for the regional system, providing a self-sustaining source of funds for the establishment, implementation, development, and maintenance of the system. Through the administration by UN-ESCAP, the fund provides a non-partisan vehicle for international funding, thereby facilitating donations without restricting their use to within the national borders of individual countries. Furthermore, the multi-hazard capacity of the system provides a critical and valuable research tool for the future, providing another avenue for not only sources of funding but the development of enhanced capacities.

This end-to-end early warning system for tsunamis and other natural hazards, initiated and strongly supported by the Royal Thai Government, will provide reliable and timely information and advice to ensure the safety and security of communities not only inside Thailand's borders, but also safeguard the lives of people living and working in or visiting communities in Thailand's neighbouring countries. Expected to be in full operation by December 2006, the regional early warning system being set up and to be operated by ADPC, with support from its close partner, the Asian Institute of Technology in research undertakings, will pre-empt any repetition of such a large-scale human tragedy should a tsunami strike again in this region of the world. The ADPC would also facilitate capacity building, research, as well as regional and international cooperation, and information sharing and exchange, components which are essential to sustainable human, scientific, technological, and economic development.





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