

Government of Thailand
United Nations Development Programme
Department of Disaster Preparedness and Mitigation

**End-to-End Early Warning System and Preparedness for
Tsunamis and Other Natural Hazards in Southern Thailand**

Project summary

The objective of the project is to support the implementation of an end-to-end early warning system for tsunamis in Thailand, in response to the Government of Thailand's needs in the execution of its disaster mitigation responsibilities and initiatives to address tsunami threats in the six tsunami-affected provinces in Southern Thailand. The project comprises the following activities:

Phase I:

- (i) support to the development of the national end-to-end multi-hazard early warning system and
- (ii) enhancement of institutional disaster management capacities and community preparedness

:

Phase II:

- (iii) public education and awareness campaigns on early warning and preparedness and
- (iv) (iv) development of national disaster risk management information system.

Section I - Elaboration of the Narrative

Part I: SITUATION ANALYSIS

The December 26th tsunami event was catastrophic in terms of lives and livelihoods lost, properties damaged and countries affected. The increase in population, tourism and coastal development considerably increased the vulnerability of coastal communities to tsunamis.

The devastating impact of this unexpected event in Thailand is extensive. Parts of the 400km western coastline of Thailand have been damaged. Affected were the provinces of Ranong, Phang-Nga, Phuket, Krabi, Trang and Satun, all located on the Andaman coast. Phang-Nga and Krabi are the worst hit areas. The combined population of these provinces is 1.9 million, with many living in coastal areas. These areas are also prime tourist areas with numerous tourist resorts located in close vicinity of the ocean. The Ministry of Interior reported 5,395 deaths, about 8,457 injured, 3,001 missing, and about 800 children orphaned. Damage includes about 4,500 boats, and more than 120,000 people's livelihoods lost. The National Economic and Social Development Board estimated there would be a 0.48% reduction in 2005 GDP from losses in tourism revenue, labor earnings and damage to business enterprises.

The unprecedented loss of lives was attributed to the lack of warning and public awareness on the nature of and response to the hazard. Establishing regional and national early warning arrangements became a priority need. Recognizing that the hazard is trans-boundary, countries in the Asia region committed themselves to concertedly addressing the risk of tsunamis (at the Special ASEAN Leaders' Meeting on the Aftermath of the Earthquake and Tsunami, 6 January 2005, Jakarta).

At the 29 January 2005 Ministerial Meeting on Tsunami Early Warning Arrangements, the Royal Thai Government advocated the establishment of a regional tsunami early warning arrangement and, to show its political commitment, established a Voluntary Trust Fund of US\$ 10 million to which it invited other countries to contribute towards the strengthening of national and regional capacities for early warning. The Royal Thai Government also initiated the implementation of its national tsunami early warning system, with focus on a strengthened dissemination system. To make the tsunami early warning system sustainable, the Royal Thai Government endeavored to move towards the establishment of an end-to-end multi-hazard early warning, in accordance to the agreement of countries in the region.

The end-to-end warning system encompasses technical elements ranging from geophysical observation through distribution of warnings, and preparedness elements that include building capacities of institutions (national down to local) to respond and undertake mitigation, with a feedback mechanism that allows post-event assessment to provide guidance to the managers and operators of the system. While the technical system is being developed and integrated into operation, building capacities of relevant authorities and vulnerable communities is considered as sustainable precautionary reduction measure.

The Department of Disaster Prevention and Mitigation (DDPM), established since 2002 as the principal government agency for disaster management, is one of the key

agencies delivering assistance to affected people in tsunami-hit regions. DDPM has recognized the indispensable importance and need of strengthening institutional capacities in disaster risk management; immediate and long term institutional development plans have been set up. For the years 2005/6, DDPM has prioritized the enhancement of emergency management, development of community networks for community-based early warning system, and public education and awareness. DDPM has also initiated the development of a comprehensive and integrated disaster database system, which would be a national clearing-house of disaster risk management information.

Part II: STRATEGY

The overall objective of the project is to support the initiatives of the Royal Thai Government in addressing its immediate plans to implement and make operational an end-to-end, multi-hazard early warning and preparedness system in Thailand. The project is specifically designed to facilitate the implementation of an end-to-end multi-hazard approach in the establishment of an early warning and risk management system for tsunamis and other natural hazards in Thailand. This end-to-end, multi-hazard approach encompasses technical elements, institutional disaster management capacities, community preparedness, and information management integration.

The project beneficiaries are the at-risk-communities ranging from villagers and schools to industries and businesses; as well as national and local government authorities who are responsible for disaster mitigation, particularly DDPM, provincial, district, municipalities and local administration organizations working cooperatively with NGO's such as the Thai Red Cross and the private sector.

The following four activities have been developed in order to enable the project to achieve its stated objective:

- (a) Phase 1 - Support to the development of the national end-to-end multi-hazard early warning system
- (b) Phase 1 - Enhancement of institutional disaster management capacities and community preparedness
- (c) Phase 2 - Development and implementation of public education and awareness
- (d) Phase 2 - Development of national level database management for multi-hazards

The project activities will be implemented in two phases during the following time frame and overall schedule based on the total budget shown.

Phase 1:

Time Frame: Start 29 July 2005 - finish 29 March 2006 (9months)

Phase 2:

Time Frame: Start 1 October 2005* - finish end of September 2006 (12 months)

Total Budget (Phase 1 and 2)

Total Budget: **USD 1,391,000***

* Phase 2 start date is subject to availability of project funds

Activities to be undertaken in PHASE I: 29 July 2005 – March 2006

Activity One:

Establishment of sea level gauge stations for the national early warning system

Activity One will establish two sea level gauge stations in Thailand under the Global Sea Level Observing System (GLOSS) in support of the development of the national end-to-end multi-hazard early warning system. While sea level gauges are important in monitoring storm surges, and in generating long-term sea level data for climate change studies they are of critical importance in the early detection of tsunamis, as they:

- a) confirm the existence or non-existence of tsunami waves following an earthquake;
- b) monitor progress of the tsunami;
- c) estimate the severity of the hazard along the coast; and
- d) provide a basis for declaring the hazard over.

The two sea level gauges are part of the regional tsunami observation network of 20 sea level stations in Southeast Asia as agreed under the IOC early warning plan. The stations will be established under GLOSS, which would enable access to data from GLOSS's network of over 300 sea level gauge stations worldwide. They are planned to be strategically located on the west coast of Thailand at Ko Taphao Noi (7°50'N, 98°26'E), and at Ko Miang (Similan Island, 08°34'N, 97°38'E). Each station will be located on concrete pilings in relatively shallow water (as little as 2 to 3 meters) and will consist of redundant water level sensors, an independent power system using solar panels and batteries, a data collection platform and satellite transmitter, and a modem line for optional call-up access to the station. High frequency data (1 minute samples) from each station will be available via WMO's Global Telecommunications System (GTS) at 15 minute transmission intervals.

Survey, installation, and training on operation and maintenance will be undertaken by the University of Hawaii's Sea Level Center (UHSLC), which implements GLOSS under UNESCO's IOC (Intergovernmental Oceanographic Commission). The Royal Thai Navy's Hydrographic Department will operate and maintain the stations. Data from these stations will be received by the regional tsunami information center at ADPC, and shared with the Thai Meteorological Department, National Disaster Warning Center, the Thai Red Cross and other interested parties. ADPC will handle the procurement of the sea-level gages and related equipment.

The sea level gauge stations are presently a critical missing element in the planned national tsunami warning system. Once these gauges are installed, Thailand will have their first link to the larger network of sea level gauge stations that will allow in-country analysis of regional sea level changes immediately after the RTG detects an earthquake anywhere in the region. This in-country tsunami analysis capability will allow the RTG to make critical tsunami warning decisions independent of external analysis or inputs they have no direct control over as is presently the case. Once this analysis and a decision to issue a tsunami warning has been made, the systems success will depend on the long-term readiness of potential affected communities being addressed by Activity Two.

Resources/inputs: DDPM, ADPC, UNESCO/IOC, GLOSS, UHSLC and TRC will be the key resources for the project implementation. TRC brings its own project funds and resources to participate in this effort.

**Activity Two:
Enhancement of institutional capacities and community preparedness**

The second project activity will enhance the capacities of authorities, institutions and communities in disaster risk management and disaster preparedness in the implementation and operation of early warning and preparedness arrangements.

2.1) Institutional capacities

One lesson learned by the Thai Government from the devastating 26th December tsunami is the need to improve internal management skills in crisis situations. To enhance the institutional capacities of DDPM officials involved local agencies and their ability to coordinate with important partners such as the Thai Red Cross in disaster preparedness and mitigation services, three custom-made training courses will be designed and organized for government authorities from the six tsunami-hit provinces during this project period as follows:

- I. Training for Instructors on basic emergency response course (3 courses)
- II. Crisis Management Course (6 courses)
- III. Damage Analysis and Needs Assessment Course (2 courses)

It is expected that over 300 government authorities will participate in these training activities. The Thai Red Cross has also agreed to participate as appropriate in these courses.

i) Training for Instructors on Basic Emergency Response Course (TFI on BERC)

The Training for Instructors on Basic Emergency Response Course is a three-week training course. The training will commence with Basic Emergency Response Course (BERC), a twelve-day training, which will provide basic knowledge and skills to emergency responders to manage safely and effectively patients during emergency and disasters situations. Afterwards, participants will proceed to the Training for Instructors Course (TFI). This six-day TFI training is designed to provide the necessary skills for instructors to conduct training effectively utilizing adult learning principles and interactive methodology. Three (3) batches will be organized with a maximum number of 24 participants set per class. A total number of 72 people will participate for this training.

ii) Crisis Management Course

Government authorities from each of the six tsunami-hit provinces will participate at the three-day intensive course on Crisis Management.

Six (6) batches will be organized with a maximum number of 40 participants set per class. A total number of 240 people will participate for this training.

iii) Damage Analysis and Needs Assessment Course (DANA)

Damage analysis and needs assessment is another key subject for government authorities, particularly DDPM officials to undertake in order to provide high quality and effective management of disaster victims. Two (2) batches will be organized with a

maximum number of 40 participants set per class. A total number of 80 people will participate for this training.

Resources/inputs: ADPC Training Unit will design and organize the above three courses in consultation with DDPM and the Thai Red Cross.

2.2) Community Preparedness

The capacities of existing community based organizations and local networking partnerships will be strengthened through community preparedness. To prepare the community for disasters, community based disaster risk mitigation (CBDRM) will tentatively be implemented in three project sites in the worst hit communities, as identified by DDPM:

- i) Moo 2, Nam Khem village, Phang-Nga province
- ii) Moo7, Phi Phi island, Krabi province
- iii) Moo3, 4 and 5, Phuket province.

CBDRM aims to prepare the above communities to assess the encountered risks, get clear understanding in multi-hazard early warning system, and play active roles in disaster risk preparedness planning and mitigation measures in need. A community participatory approach will be used during the implementation of this activity.

This project implementation will also run in collaboration with other key disaster agencies also undertaking CBDRM approaches in the affected areas, particularly the Thai Red Cross (TRC). Before project activities begin, DDPM, ADPC and the TRC will meet to plan a mutually compatible CBDRM approach that will allow DDPM and the TRC to build a long-term working relationship that will enhance the ability of these two important partners to work in synergy to reduce the vulnerability of these and other at-risk communities.

Resources/inputs: DDPM, ADPC, and TRC will be the key resources for the project implementation. TRC brings its own project funds and resources to this effort.

Activities to be undertaken in PHASE II: October 2005 – September 2006

Activity Three: Public Education & Awareness

This activity focuses on providing and disseminating public education and awareness to a wide range of at-risk groups of people; specifically, villagers, schools, industries and businesses. In addition, the local government, national and local private sector (e.g., Coca Cola, hotels and businesses connected to the tourism industry, etc.) and non-governmental organizations such as the Thai Red Cross (TRC) and others will be encouraged to become involved and participate in supporting the public awareness activities.

3.1) Workshop on Risk Management and Early Warning Systems

DDPM has identified 600 school teachers at 415 schools located in the tsunami-prone areas who will participate in the interactive workshop on multi-hazard disaster preparedness, risk management and early warning systems. The workshop will provide school teachers with knowledge on multi-hazard disaster preparedness, risk management and early warning systems and curriculum guidelines for in-class lessons and teaching materials/publications developed during the project. In the long run, DDPM plans to continue to run such workshops on its own by offering it to a greater number of teachers in the tsunami prone areas as well as other high risk areas throughout Thailand.

Resources/inputs: DDPM and ADPC will be the key actors in the implementation. Additional resources will be provided by the Ministry of Education, Meteorology Department, etc. The TRC will also bring its own project funds and resources to participate in this effort.

3.2) School-Based Student Activities

Schools in the at-risk provinces will be invited to propose school-based activities to be undertaken at the initiative of their own students. These activities aim to promote education and awareness among the students and their families regarding preparedness, disaster risk reduction and early warning systems. A total of 18 schools from 6 provinces (3 schools each from one province) will be selected to join these activities. Under the guidance of teachers, school clubs will be formed and students will be enabled to develop a range of activities in the schools and their communities.

Resources/inputs: DDPM and ADPC will provide necessary guidance to school and monitor the progress of activities. The TRC will also bring its own project funds and resources to participate in this effort. In addition, national and local private sector companies and associations will be approached to support this activity (e.g., national and local Coca Cola representatives, Chambers of Commerce, hotels and businesses connected to the tourism industry, etc.).

3.3) National Safety Day

An annual National Safety Day on 26 December 2005 has been proposed by DDPM to be established and observed every year afterwards. A special event will be organized in one of the six tsunami-hit provinces to commemorate the loss of lives during the 26th December Tsunami and to disseminate communications nationwide on disaster preparedness, disaster risk management and early warning systems.

Resources/ Inputs: UNDP, DDPM, ADPC and the TRC will be key actors in the establishment of this annual event. The TRC will also bring its own project funds and resources to participate in this effort. In addition, national and local private sector companies and associations will be approach to support this activity (e.g., national and local Coca Cola representatives, Chambers of Commerce, hotels and businesses connected to the tourism industry, etc.).

3.4) Development of Public-Awareness Materials

DDPM has developed a list of tsunami-awareness publications for dissemination to 22 coastal provinces in southern Thailand. The publications will be produced in both Thai and English languages.

- (i) Posters on tsunami safety tips (100,000 copies in Thai & 50,000 in English)
- (ii) Posters on tsunami evacuation signs (100,000 copies in Thai & 50,000 in English)
- (iii) Booklets on preparedness measures (100,000 copies in Thai & 50,000 in English)
- (iv) Animated cartoons on tsunamis - (15,000 CDs)

Apart from tsunami-awareness publications, DDPM and ADPC have developed a TV program campaign on multi-hazard awareness. Since February 2005, DDPM and ADPC have co-produced 3-minute public awareness program on tsunami, earthquake, flood, and landslide. The 20-part series on tsunami and earthquake has been broadcasted on Thailand's Channel 11 and is still on being broadcast on Channel 9. The other 20-part series on flood and landslide is due to be on show on Channel 3 from June to August 2005.

There is another 20-part series on drought and forest fire so as to cover 6 major natural hazards. Another 20-part series for everyday safety such as safety in the house, on the road, in office and factory or school is also planned for. In doing this, 4-million-baht budget is needed (100,000 baht for each part) to produce drought and fire and everyday safety series, which are due to be on air from August to November 2005.

These series explain to the general public in an easy and interesting way how to stay safe in different circumstances following and before the respective disaster or accident. The viewers will also learn about the causes effects, prevention and mitigation measures for each type of disaster or accident. Each and every program will also be produced to be viewed by international audiences with English subtitle, so tourists traveling in Thailand can learn the same safety information and awareness as the Thai general public. If possible, translation into other key tourist languages will be included in this effort.

Resources/ inputs: UNDP will provide major inputs in translating and editing the publications and broadcasts for use in other languages. ADPC will coordinate and manage the process where needed and will keep track of the operation. The TRC will also bring its own project funds and resources to participate in this effort.

**Activity Four:
Development of National Disaster Risk Management Information System**

This activity responds to DDPM's intention to develop and implement a comprehensive national disaster risk management information system. The activity is a preliminary step to support DDPM's ultimate goal of developing a national disaster risk management information system that covers a range of hazards that will be used and maintained by DDPM but also open and internationally accessible for use by anyone else that needs this important disaster risk management information analysis tool.

At present the DDPM has three different databases of risk management information (for example, a Road Accident Database and a Hazardous Materials Database) that they can not use together because they were each developed by different universities using different software. Further, these databases are not available to potential users outside the department. In addition to these databases, DDPM and other users of risk management information need to link this and other similar information sources (for example seismic and flood hazard information) to base map information produced, updated and maintained by other agencies such as the Department of Land Transportation, Department of Environmental Resources and/or Town and Country Planning. They presently do not have the inter-agency agreements or technology in place to achieve this.

Geo-spatial information, such as remote sensing images, aerial photographs, existing maps, field survey photos/ movies, survey records, including socio-economic data, land use maps, critical facilities information, etc. are baseline information on which the analysis to guide disaster prevention and mitigation decisions should be made. Such analysis included hazard impact modeling, risk map development, early warning dissemination, damage mapping, and mitigation planning for infrastructure and natural resources rehabilitation. Such analysis involves the overlaying of risk management information with base information developed and updated at numerous diverse sources such as the Department of Land Transportation, Thai Meteorological Department, GISTDA or Town and Country Planning.

This base information resides with the agencies that produce them (for example, see Table 1 below). Recent technology has made it possible to share, overlay and more easily access this information over the Internet through the Web Map Service (see WMS, Figure 1 on the following page). The WMS enables users to access and overlay various types and sources of data, as well as data import to their local system for analysis and overlay with multiple background images. Decision makers, engineers, planners, researchers, and local communities can therefore share and access useful information.

Table 1. Information available from various government agencies

Name of agency	Hazard			
	Flood, landslide, drought, storm	Tsunami	Chemical	Road accident
Office of the Prime Minister		√		
Ministry of Defense			√	
DDPM				√
Thai Meteorological Department	√			
Royal Irrigation Department	√			

Department of Mineral Resource	√			
Royal Forestry Department	√			
GISTDA	√			
Ministry of Agriculture		√	√	
Fisheries Department		√	√	
Dept of Livestock Development		√		
Food and Drug Administration			√	
Dept. of Lands		√		
Dept. of Energy			√	
Min. of Development & Human Security		√		
Dept. of Industrial Work			√	
Ministry of Public Health		√		√
Dept. of Employment		√		
Dept. of Land Transport			√	√
Port Authority of Thailand			√	
Dept. of Provincial Administration				√
Dept. of Local Administration		√		
75 provinces				
Religious Affairs Department		√		
Office of Atoms for Peace			√	
Royal Thai Police				√

WMSs of made up of various data and information generated by various agencies and organizations can be linked to form a network and allow users to obtain data from multiple WMSs without knowing where the data is being served from (see Figure 2 on the following page). A One-Stop Map Service server can be developed as a gateway to multiple WMS networks to reduce the burden to users' of collecting URLs (Uniform Resource Locator) for each WMS server. To allow standard analytical procedures, application software needs to be developed.

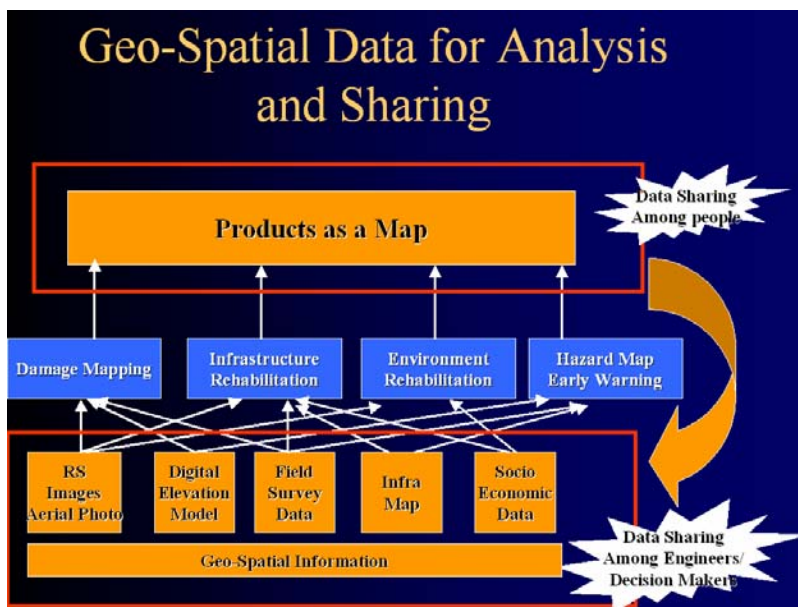


Figure 1. Conceptual framework of geo-spatial information database

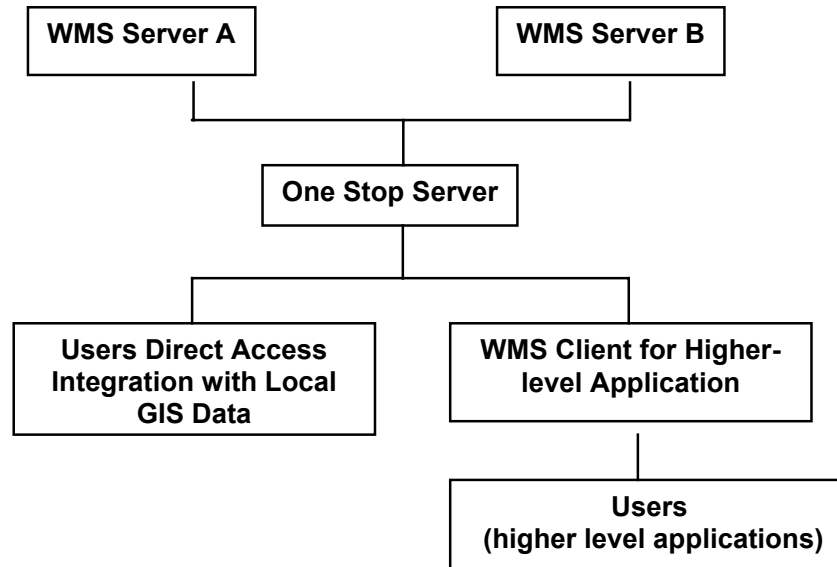


Figure 2. Conceptual framework of data sharing using Web Map Service

The Asian Institute of Technology (AIT), in collaboration with 13 other institutions, has launched a WMS for tsunami geo-spatial information sharing, using Free and Open Source Software (FOSS). It serves remote sensing images taken before and after tsunami event from various satellites including very high resolution images (1m resolution), aerial photographs, base infrastructure maps, photos and movies from field survey. It is currently developing a prototype of a One Stop Map Server which will be a gateway to WMS network. Also, AIT has designed and implemented a real-time, three-dimensional flight simulation capability that enhances the ability to overlay data on high-resolution images, which is very helpful for understanding real-time situation on the ground.

ADPC and AIT (with appropriate input and consultation with its 13 other collaborating institutions) will work together to first identify potential users of such an information system such as local government, local and national NGO's such as the Thai Red Cross, etc.). Once identified, ADPC and AIT will work with these potential users directly one-on-one, in smaller meetings and in a workshop format to identify the kind of information they can use and will need to be able to analyze risk from each of their unique perspectives. Meanwhile, AIT will identify all the potential sources of information. Once this understanding has been achieved and documented, AIT will design the electronic information sharing system described above that will form the basis for the Thai Multi-Hazard, Disaster Risk Management Information System.

Activities that would be carried out in the first six months include:

1. Conduct of a workshop that brings together generators and users of information. The workshop will identify the type of information that users would need, the information already available from various agencies, new information that need to be generated to meet user requirements, and required elements to generate the new information (e.g. application software, etc.).
2. Design of the national disaster risk management information system, taking workshop inputs. The design would consider the need to layer information from

- various sources, data analyses requirements to meet user information needs, availability of data from national down to local level, and quality of available data.
3. Forge agreements with various agencies, institutions for data sharing and access
 4. Data collection and integration into a database (cleaning, adjustment, format conversion, consistency check)
 5. Pilot testing of the information system utilizing data for a type of hazard for a specific area.
 6. Establishing a WMS server to serve the database

Outputs:

1. Workshop report
2. Information system design
3. Report on system performance from pilot test run

Activities which will be undertaken at the later stage include:

1. Standardize analysis procedures for each type of hazard for national, provincial, village level planning
2. Develop mobile updating system to utilize real-time data/ information
3. Expand information system to cover other types of hazards

Resources/Inputs: AIT will take the lead role in providing technical assistance to DDPM Information Technology unit and liaise with DDPM Information Technology unit. ADPC will take the role of coordination and contribute disaster-related user needs and inputs and any other support required during project implementation.

Part III. PROJECT MANAGEMENT

The project will be implemented through the DEX modality by UNDP under the governance of a Project Executive Group consisting of five representatives; one each from DDPM/MOI, UNDP, IFRC, Thai Red Cross, and TICA. This Project Executive Group will be established at the beginning of the project before activities begin and will meet regularly to review project progress and ensure that budgetary and delivery targets are complied with.

DDPM will nominate a Project Manager to oversee the project on its behalf. This Project Manager will be responsible for the day to day management, coordination and decision making for the project. UNDP will provide Project Assurance through objective and independent project oversight and monitoring from its project management staff in support of the Project Executive Group.

As requested by DDPM, ADPC will be the primary implementing partner responsible for overall project implementation, working under the leadership and guidance of DDPM. ADPC will enter into separate agreements with other institutions as necessary to implement the project.

DDPM will be the Thai Government agency responsible for project implementation, overseeing the coordination with ADPC and the Thai Red Cross, and facilitating access to programs and services under its governance, as necessary for the successful completion of the project.

Part IV: MONITORING AND EVALUATION

ADPC, in cooperation with DDPM, will provide the following project activity reports to UNDP on a timely basis.

Quarterly Reports: Quarterly progress reports, will highlight a summary of accomplishments, update work plans, update project financial status and identify problems/new opportunities, lessons-learned and constraints encountered during project implementation.

Project Final Report: A project terminal report, in accordance with established guidelines and procedures, will be prepared and submitted to UNDP at the end of the project.

Joint Assessment: Towards the end of the project, the project partners, in conjunction with UNDP, will hold a joint assessment session to review the overall project outcomes.

Part V: LEGAL CONTEXT

The project document shall be the instrument envisaged in the Standard Supplement Provisions to the Project Document.

The following types of revisions may be made to this project document with the signature of the UNDP Resident Representative only, provided she is assured that the other signatories of the project document have no objections to proposed changes:

- Revision in, or addition of, any of the annexes of the project document and the agreement, which is a precondition for UNDP assistance;
- Revision, which does not involve significant changes in the immediate objectives, outputs and activities of the project, but are caused by the rearrangement of inputs already agreed to or by cost increases due to inflation;
- Mandatory revisions, which re-phase the delivery of agreed project inputs or increased expense of other costs of which take into account agency expenditure flexibility.

SIGNATURE PAGE

Country: Thailand

Implementing partners: Department of Disaster Prevention and Mitigation (DDPM), Ministry of Interior, Royal Thai Government, the Asian Disaster Preparedness Center (ADPC) and United Nations Development Programme (UNDP) as executing partner

UNDAF Outcome(s)/Indicators: Thailand Tsunami Disaster

Country Program Outcome(s)/Indicators: Thailand Tsunami Disaster

Programme Period: <u>June 2004 – December 2006</u>	Budget <u>US\$ 1,300,000</u>
Programme Component: <u>Thailand Tsunami Disaster</u>	General Management
Project Title: <u>End-to-End Early Warning and Preparedness System for Tsunamis and Other Natural Hazards in Southern Thailand</u>	Support Fee: <u>US\$ 91,000</u>
Project ID: _____	Total budget: <u>US\$ 1,391,000</u>
Project Duration: <u>12 months</u>	Allocated resources: <u>US\$ 500,000</u>
Management Arrangement: <u>DEX</u>	<ul style="list-style-type: none">• Government• Regular <u>US\$ 500,000</u> (TRAC 1.1.1 & 1.1.2)• Other:<ul style="list-style-type: none">○ Donor <u>US\$ 891,000</u>○ Donor _____○ Donor _____• In kind contributions _____• Unfunded budget: _____

Agreed by

Thailand International Development Cooperation Agency (TICA)
(Royal Thai Government)

Agreed by

Department of Disaster Prevention and Mitigation (DDPM), Ministry of Interior (MOI)
(Implementing Partner)

Agreed by

United Nations Development Programme (UNDP)

Section II – Results Framework

Project Title and ID: End to End tsunami and multi-hazard early warning system in Southern Thailand					
Phase I					
Objective 1: Establishment of sea level gauge stations for the national early warning system					
Intended Outputs	Beneficiaries	Location	Target/ Indicators	Indicative Activities	Inputs
1. Support the development of the national end-to-end multi-hazard early warning system	Government, Research organizations, Coastal communities	Thailand, Phuket and Phang-Nga	- 2 sea level stations established. - At least 2 staff of the Royal Thai Navy Hydrographic Dept trained in the operation and maintenance of the station	1.1 Establishment of two sea level gauge stations, on the west coast of Thailand at Ko Taphao Noi (7°50'N, 98°26'E, GLOSS Station No. 42), and at Ko Miang (Similan Island, 08°34'N, 97°38'E). 1.2 Training of Royal Thai Navy Department on operation and maintenance of sea level stations	-ADPC/DDPM Coordination -Technical support from UHSLC -Royal Thai Navy Cooperation

Phase I**Objective 2: Enhancement of institutional capacities and community preparedness**

Intended Outputs	Beneficiaries	Location	Target/ Indicators	Indicative Activities	Inputs
2.1 Increased capacities of local government authorities and stakeholders in disaster risk management	Local & National government, Communities,	Thailand:- Krabi Phang-Nga Phuket Ranong Satun Trang	- Training curricula, and materials developed - at least 390 government officials trained (240 in Crisis Management, 80 in DANA, and 72 in ToT for Search & Rescue	2.1 Training of national and local government offices particularly DDPM officials, in Crisis management, Damage Analysis & Risk Assessment (DANA) and Training for Trainers on Search & Rescue (S&R)	-Curriculum, manuals and materials for training; - Resources from ADPC training unit
2.2 Increased capacities of at-risk communities in community-based disaster risk management and early warning system.	Three most at-risk communities	Thailand:- Krabi Phang-Nga Phuket	-120 community leaders and representatives from three provinces (40 each) to participate in the CBDRM program - Developed community action plans	2.2.1 Implementation of community-based disaster risk management program (CBDRM) at community level 2.2.2 Preparation for the community in multi-hazard early warning system 2.2.3 Evacuation drills	-Training workshops (5 months) - Discussions, Exercises

**Phase II:
Objective 3: Public Education and Awareness**

Intended Outputs	Beneficiaries	Location	Target/ Indicators	Indicative Activities	Inputs
3. Raised public education & awareness in EWS and disaster risk management	Local & National government, Communities, Stakeholders	Thailand:- Krabi Phang-Nga Phuket Ranong Satun Trang	<ul style="list-style-type: none"> - 600 school teachers trained - Curricula developed for teaching aids - 18 schools from 6 provinces participated - dissemination of materials to public - Participation from various sectors, GO, NGOs, local stakeholders 	<ul style="list-style-type: none"> 3.1 Workshop of teachers on EWS 3.2 Risk communication activities for students 3.3 Development of Public awareness materials, publications (posters, booklets, animated cartoons, t-shirts, etc) and TV programme 3.4 Organization of the National Safety Day 	<ul style="list-style-type: none"> - 6 Workshops (1 in each province) - Curriculum development specialist - Guidelines for risk communication activities - Technical support and inputs from UNDP in the design and translation - Involvement from local private sectors, i.e. coca-cola, hoteliers, etc - Survey - Meetings - Networking

**Phase II:
Objective 4: National Disaster Risk Management Warning and Preparedness Information System**

<p>4. Develop a Comprehensive National Disaster Risk Management Warning and Preparedness Information System</p>	<p>National and local government, Institutions, Academics, Communities</p>	<p>Thailand</p>	<ul style="list-style-type: none"> - Workshop Report Information System Design - Data collection for hazards initiated - Report on system performance from pilot test run - WMS server for DDPM developed 	<p>4.1 Organization of a workshop for users of information to identify needs and required dataset</p> <p>4.2 Design of the national disaster risk management information system</p> <p>4.3 Data Collection</p> <p>4.4 Pilot testing of the information system</p> <p>4.5 Establishment of WMS server</p>	<ul style="list-style-type: none"> - Consultant services and Technical support from AIT - Meetings - Various agencies, institutions for data sharing - Assessment survey - Various agencies, institutions for data sharing
---	--	-----------------	--	--	---

Section III – The Total Work Plan and Budget - Phase I and II

PHASE I (JULY 2005 - MARCH 2006)

Activity	Sub-Activities	Time Frame 2005/06				Responsible Party	Planned Budget				
		Q 3	Q 4	Q 1	Q 2		Fund	Donor	Acct Code ATLAS	Budget Description	Amount (USD)
1. Support to the development of national end-to-end multi-hazard early warning system	1.1 Establishment of two sea level gauge stations, strategically located around the Gulf of Thailand.	X				ADPC, UHSLC, & Hydrographic Dept, Royal Thai Navy			72300	Materials & Goods	119,500
	1.2 Training of Royal Thai Navy on operation and maintenance of the sea level stations		X	X					71200	International consultants	71,000
									72100	Contractual Services - Companies	12,500
										Sub-activities (1.1-1.2)	203,000
										7% UNDP GMS fee	14,210
										Total for Activity 1	231,420

Activity	Sub-Activities	Q 3	Q 4	Q 1	Q 2	Respon. Party	Fund	Donor	Acct Code ATLAS	Budget Description	Amount (USD)
2. Enhanced institutional capacities and community preparedness in disaster risk management and early warning system	2.1 Three training courses for national and local government offices on Crisis Management, Damage Analysis and Needs Assessment, and Search Rescue	X	X	X		ADPC DDPM (TRC)			71200	International Consultants	67,000
									74500	Training	144,600
									71200	International Consultants	5,600
	2.2 Implementation of community-based disaster risk management (CBDRM) at community level		X	X	X	ADPC DDPM (TRC)			71300	Local Consultants	4,800
									74500	Training	75,000
										Sub-activities (2.1-2.2)	297,000
										7% UNDP GMS fee	20,790
										Total for Activity 2	317,790

PHASE II (OCTOBER 2005 - SEPTEMBER 2006)

Activity	Sub-Activities	Time Frame 2005/2006				Responsible Party	Planned Budget				
		Q 3	Q 4	Q 1	Q 2		Fund	Donor	Acc Code ATLAS	Budget Description	Amount (USD)
3. Promote public education and awareness in disaster risk management and early warning system	3.1 Workshop for teachers in six tsunami-hit provinces			X	X	ADPC DDPM (TRC)			74500	Training	29,200
									74100	Technical support services (curriculum development)	2,000
	3.2 Risk communication activities for students			X	X	ADPC DDPM (TRC)			72000	General operating expenses (for schools' activities)	12,300
	3.3 Organization of the National Safety Day			X	X	ADPC DDPM TRC UNDP			72000	General operating expenses (for organizing activities)	16,300
	3.4 Development of public education materials			X	X	DDPM UNDP ADPC			72300	Materials & Equipment	326,700
										Sub-activities (3.1-3.4)	386,500
										7% UNDP GMS	n/a
										Total for Phase 2 Sub-Activities 3.1-3.4	386,500

PHASE II (OCTOBER 2005 - SEPTEMBER 2006)

Activity	Sub- Activities	Q 3	Q 4	Q 1	Q 2		Fund	Donor	Acc Code ATLAS	Budget Description	Amount (USD)	
4. Develop a national disaster risk management information database	1. Organization of the workshop	X				AIT ADPC DDPM			71000	Operating Expenses	54,300	
	2. Design of the national disaster risk management information system		X	X					71205	International Consultants (Technical)	144,000	
	3. Data Collection and Pilot Testing of the information system	X	X	X	X				72800	IT Equipment	22,900	
	4. Establish a WMS server				X	X				71600	Travel	2,000
										74500	Miscellaneous	12,300
										Sub-activity (4.1-4.4)	235,500	
										7% UNDP GMS	n/a	
	5. Data set Procurement		X	X	X				72800	IT Datasets and Equipment	178,000	
										Total for Phase 2 Activity 4	413,500	
