Total Disaster Risk Management

Good Practices

2006 Supplement

Asian Disaster Reduction Center
March 2006

Foreword

In recent years, natural disasters have been affecting an increasing numbers of people throughout the world. The Indian Ocean Tsunami caused an enormous tragedy the year before last, and moreover, the South Asia Earthquake in Pakistan October of last year resulted in huge number of lives in the Islamic Republic of Pakistan, India and surrounding areas. It is important to point out that the Asian region accounts for nearly 90% of the world's affected population.

But these crises triggered and brought about serious awareness for the necessity of regional solidarity. The support for emergency preparedness and response has been expanded over the entire world immediately after the disasters. Disaster mitigation and prevention require the involvement of everybody, and it requires the organized participation of the entire population. National and international resources are needed to reduce the vulnerability of the population.

Asian Disaster Reduction Center (ADRC) will not only continue to support the development of scientific capability against disasters, but will also pay increasing attention to the social dimensions of disaster prevention. ADRC has collaborative status with the United Nation Office for the Coordination of Humanitarian Affairs (UN-OCHA) Kobe and International Recovery Platform (IRP), and also works in collaboration with many stakeholders in Asia. ADRC and these partner organizations have formulated a holistic approach to disaster risk reduction known as Total Disaster Risk Management (TDRM).

"Total Disaster Risk Management: Good Practices" is a user-friendly handbook including the concept of TDRM and its good practices, that was published for UN World Conference on Disaster Reduction that was held on 18-22 January 2005 in Kobe, Japan. Herein "2006 Supplement of Good Practices" contains good practices submitted by ADRC member countries for relevant stakeholders to share knowledge in order to contribute to global disaster risk reduction.

Furthermore, it would be our great pleasure to continue receiving a broad range of good practices from you. I hope this publication will stimulate the promotion of the TDRM approach and contribute to efforts to build a safer world.

March 2006

Masayuki Kitamoto
Executive Director
Asian Disaster Reduction Center

Contents

Safety of Existing Dams for Irrigation in Rural Area

Armenia

Natural disasters such as earthquakes, floods. landslides, avalanches and mudflows may cause failure and destruction of hydro-technical facilities.
Most dams are operating quite long time and special attention should be paid to exploitation risk.
Consequences of recent major earthquakes in India, China, Japan and Iran once again revealed that seismic resistance of most dams is lower than expected maximum level of seismic impact.
At present 82 mostly earth dams are operating in Armenia.
Armenia is a country with high dam location (3 dams per 100 sq. km) and population (more than 100 people per 1 sq. km) density.
Most dams are located at 1500 - 2500 m above sea level.
50 small dams have been constructed many years ago disregarding modern approaches for dam design and construction, and those dams represent high risk for population and lifelines in downstream.
Dam maintenance risk is crucial for priority inspection, rehabilitation and early warning.
Since the small dams are filled out in 2-3 month it is essential to evaluate properly maximum expected flood though some dams have no spillway.
Absolute number of small dams constructed on the base of old maps of seismic zoning and codes.
Expected seismic intensity in most Armenia's territory has been increased by 1-2 value of intensity in the last 20 years.
Provided risk evaluation is based on dam and reservoir characteristics, number of people to be evacuated and potential damage of crops, buildings and property.
Due to lack of necessary information on small dams it is difficult to realize the approaches recommended by the ICOLD and other National committees.
The field inspection has been provided in order to acquire data, as well as the information obtained from local governments and dam personnel responsible for dam safety.
Data on recent dam failure have been acquired and special geophysical and updated hydrological computation have been performed.
Data obtained have been classified by importance of risk ranking on weight inputs.

fig. 1 The bowl of the Shenik reservoir

The Shenik reservoir (fig. 1) is located in Aragatsotn marz (region) and is situated about 28 km away of the nearest fault.
The reservoir was constructed in 1969.
The height of the dam is 18.0 m.
The reservoir capacity is 0.78×10^6 cub. m.
The surface area is 12.2 ha.
The check seismic intensity is 8 value on MSK-64 intensity scale.

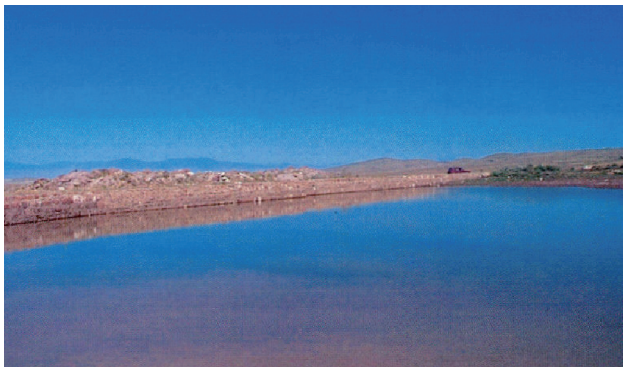

Fig. 2 The view of the Eghnik dam from upstream

The Eghnik reservoir (fig. 2) is located in Aragatsotn marz (region) and is situated about 24 km away of the nearest fault.
The reservoir was constructed in 1961.
The height of the dam is 3.0 m.
The reservoir capacity is $0.06x10^6$ cub. m.
The surface area is 0.44 ha.
The check seismic intensity is 8 value on MSK-64 intensity scale.
Population at risk represents about 200 people.

- **Background** Dam seismic risk reduction.
- **Objective** Seismic risk assessment.
- **Term/Time Frame** 9 months.
- **Activities undertaken** Creation of database on dam condition and partial failure
- **Major achievements** Classification of risk for rural dams
- **Total budget** US 5000$

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Some Experiences for Making People Calm that Caused Rumours after the Earthquake Events in Indonesia

Indonesia I

By : Center of Volcanology and Geological Hazard Mitigation (CVGHM) Bandung, Indonesia

Indonesia lies on the tripple junction of three major active plates, namely : Eurasia, Indo Australia and Pacific. As a concequence of this situation, Indonesia is a very active earthquake source zones. The source zone are generally represented by a subduction type and active faults.

The biggest event ever recorded was the December 26, 2004 earthquake, followed by tsunami in Aceh region. This event shook the world, not only by the rareness of its magnitude (Mw = 9.2), but also by the huge amount of casualties that catastrophed the region.

During 2005, earthquake events are still continuing. Some events of destructive earthquakes are shown on the table 1 below.

NO.	Location	Date of Occurences	Epicenter	Depth (Km)	MAG	MMI
1	Palolo, Sulawesi	24/1/2005	1.03 S; 119.99° E	30	6.2	VII
2	Garut, West Java	2/2/2005	108.7° E; 7.2° S	10	4.2	V
3	Bau bau, Sulawesi	19/2/2005	122.34 E; 5.99 S	33	6.9	V
4	Nias, North Sumatra	28/3/2005	2.07° N; 97.01° E	30	8.7	VIII
5	Padang, West Sumatra	10/4/2005	1. 62° S; 99.56° E	30	6.8	V
6	Gunung Halu, West Java	15/4/2005	107.45° E; 7.19° S	5	5	V
7	Cot Glie, Aceh	5/10/2005	95.6° E; 5.2° N	10	5.7	V
8	Buru Island, Maluku	1/11/2005	127.34° E; 3.61° S	13	5.7	V
9	Seram Island, Maluku	13/11/2005	128.94° E; 3.08° S	6.4	5.9	V

Table 1. Destructive earthquake events in Indonesia during 2005 (source : CVGHM, 2005)

Earthquake occurences in 2005 had only one event followed by a minor tsunami and not causing any significant damage. It was Nias earthquake on March 28. Even though this quake had a rather big magnitude (8.7), with its epicenter below the sea, fortunately it did not generate any significant tsunami wave, only a minor tsunami observed in Nias Island and on the shore of small islands in the region.

When an earthquake occurs below the sea floor, the panic among the people was not only due to the earthquake's shaking but also to the rumour following it. Some of there rumours were even born in areas situated far away from the earthquake epicenter. Below some experiences about socialization to the inhabitant after earthquake occurences are presented.

An example of a rumour that made people panic in the area just shook by the quake was Palu City on Sulawesi island. On January 24, 2005 an earthquake occurs, with an epicenter situated on land approximately 35 km south east Palu city. The people in Palu city were already moved to the higher ground outside of Palu City because they heard from the rumour that the quake would be followed by a tsunami. To calm the people down and make them return to their own house, a team from CVGHM was sent to Palu City and held a meeting with the Major of Palu city, administrator of village up to city levels,

and directly socialized with the people. After this meeting was held, the people ended by trusting the team on the fact that the quake would not be followed by a tsunami, and little by little inhabitants went back home.


The direct socialization of earthquake and tsunami to the people in Palu, Sulawesi island

Just after an earthquake occured in Garut District, West Java on February 2, 2005, the people around the geothermal field thought that the earthquake was triggered by the drilling activity of the geothermal company. The people started to blame the company and reacted by doing blockades on the road leading to the geothermal field area. Some hundreds of geothermal company employees were not able to go home after work that day, while the people were waiting an explanation of the company concerning the quake. The explanation made by the company and from the chief district finally came, but did not satisfy the people. They wanted the explanation from the formal office who responsible of the earthquake matter, a member of CVGHM. After receiving the phone call from the chief district, a team from CVGHM was sent to the 'conflict' area and reached the area at about one o'clock in the morning. The team explained to the people that the earthquake had not been triggered by the geothermal drilling activity. The explanation satisfied the people, who shortly reopened the road leading to the geothermal field and 'released' the employee for them to return home.

The second experience was the exodus of Nias Island inhabitants who tried to go to Sumatra Island because of their fear of a rumour that the earthquake event, on March 28, 2005, would be followed by a very big tsunami. The Quick Response Team, that was already installed in Nias Island just after the quake, became very active in making the people sure that the earthquake would not be followed by a tsunami in their region. Hundreds of people were successfully sent back to their village.


Destructive earthquake in Nias on March 28, 2005.

Another example of a rumour that made people panic was Bengkulu City, South - West of Sumatra, following an earthquake on April 6, 2005, which epicenter lied on land approximately 25 km south east Bengkulu city. The people that lived in coastal area were already moved to the higher ground outside of Bengkulu City because they heard from the rumours that the quake would be followed by a tsunami. The people went on panicing for several days after the main shock and didn't know what to do. To calm the people down and make them return to their house, a team from CVGHM was dispatched to Bengkulu City and held a meeting with the administrator of the village up to city levels and directly socialized the local people. After this meeting, the team gainded the trust of the peope that the quake would not be followed by a tsunami, and little by little inhabitants returned home. This earthquake did not have any destructive effect.

Another story concerning rumours that made people panic happened in Padang City in West Sumatra, following an earthquake event in April 10, 2005, whose epicenter lied off shore of West Sumatra west coast. The people were already moved to the higher ground outside Padang City because they heard from the rumours that the quake would be followed by a tsunami. The people were panicking even after several days after the main shock. Moreover, in April 12, 2005 a volcano near the city also erupted. The people of course panicked even more and didn't know what to do. To calm the people down and make them return

back to their house again, a team from CVGHM was dispatched to Padang City and organizaed a big meeting with the village administrators up to city levels, including senior and honorable inhabitants, which was facilitated by the Major of Padang City. After this meeting the team gained the poeple's trust that the quake would not be followed by a tsunami, and little by little the inhabitants returned home.
The five experiences above show that socializations concerning a kind of geological hazard are very important. People in disaster areas are very vulnerable to rumours created among them. This situation would not happen if the people were directly educated through socialization from the early beginning.

Earthquake Quick Response Team of CVGHM

1. Background
Indonesia lies on the tripple junction of three major active plates, namely: Eurasia, Indo Australia and Pacific. The concequences of this situation make Indonesia to become a very active earthquake source zone. One of task and function of the Center of Volcanology and Geological Hazard Mitigation (CVGHM) is to conduct earthquake mitigation. To support this program the CVGHM has conducted several researches: monitoring of active fault, mapping of earthquake hazard zone, socialization, producing map of active fault distribution & destructive earthquake epicenter, producing map of earthquake hazard zones, cataloging of destructive earthquake of Indonesia, arranging guide for socialization, etc. Especially for earthquake mitigation during occurences, the CVGHM has arranged quick response teams for earthquake.

2. Objective
The objective is to reduce the number of victims and lost of property caused by earthquake disasters.

3. Term/ Time Frame
Earthquake response teams responsible continously to monitoring earthquake occurence in Indonesia and make reports to the head of CVGHM. After every destructive earthquake event, if possible, the team will go to the location of the earthquake disaster during a period of approximately for 15 days.

4. Activities Undertaken
The earthquake quick response team of CVGHM is responsible: to monitor after shock, to make an inventory of impacts by earthquake, directly socialize the people, to make earthquake intensity map, and to give technical recommendations to local governments.

5. Major Achievement
The major achievements of the earthquake quick response team CVGHM have been to make people calm, not panic and give technical recommendations to local governments.

6. Total Budget
The total budget for earthquake quick response team in case of destructive earthquakes in java island amounts to approximately Rp. 20 Million. If outside of java island approximately Rp. 50 Million.

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Landslide Quick Response in West Java and West Sumatra, Indonesia

Indonesia II

Indonesia lies on the tripple junction of three major active plates, namely: Eurasia, Indo Australia and Pacific. The concequences of this situation makes Indonesia vulnerable to geological hazard, and the topography of steep hills makes it vulnerable to landslides. Landslide occurence is increased by high rain fall.

In 2005, landslide occurences happened on a regurlar basis. The highest rain fall period is between the months of December 2005 and February 2006. During this period, landslide occurences are therefore at their peak. There were 45 events of landslides in 2005 in Indonesia, and West Java represents the area where the biggest amounts of landslides occur. The number of victims and frequency of landslide occurences are shown in the table below.

No.	Location	Victims		Destroyed Houses	Damaged Houses	Threated Houses
		Dead	Injured			
1.	West Java	205	13	110	428	768
2.	Central Java	3	-	7	5	20
3.	East Java	1	-	2	37	2
4.	Aceh	8	-	151	-	-
5.	North Sumatra	3	-	1	-	8
6.	West Sumatra	25	9	16	-	-

Table 1. Victims and damaged houses by landslide during 2005.

In this table, we can see that there were 2 major landslides, wihch involved the *Landslide Quick Response Team (LQRT)*: Ciamis landslide of West Java and Lubuk Begalung landslide of West Sumatra.

Crown of landslide height 3 m as a rice field at Situmandala village, Ciamis, West Java.

Ciamis represented one of the landslide occurences in West Java in the year 2005. This landslide occured in December 12, 2005 in Situmandala village, Rancah districk, Ciamis regency, West Java and is still subject to research by LQRT of Center of Volcanology and Geological Hazard Mitigation (CVGHM). The type of landslide was slump, followed by fracturing. The dimensions of landslide were as follow: length of 50 meters, wide of 20 meters, height of crown of 1 – 5 meters, subsidence of 1 – 5 meters. The situation of disaster area was encouraged by steep hilly slope of 45º, as a bedrock was made from tuffaceous sandstone, part of Tapak Formation, and had weathered with thick approximately 4 meter. The landslide site was a rice field, plantations and in a part of a disaster area constituted of a group of housing. The causes of this lanslide were: the big amount of rainfall before the landslide, steep slope, rareness of vegetation in the upper slope, dominant use of the land by wet rice field in upper slope, lithology consisting of weathered tuffaceous sandstone which created a weak zone. About the landslide suceptibility zone map of West Java created by CVGHM, the disaster area was included as a high suceptibility zone, meaning that in this area landslide occurences are common and the old landslide can be active in case of high rainfall or change of landuse. The landslide could cause five hectars of rice field to be covered with landslide material, break off roads and threat 28 houses. LQRT has given recommendations to the Local Government, which were divided into :

- ✓ Short term recommendation : 4 houses situated below the landslide material must be relocated and fractures in the upper slope must be filled with clay to prevent infiltration of water.

- ✓ Mid term recommendation : 24 houses in the lower slope must be relocated and before that, people must be evacuated in case of continuing heavy rainfall.
- ✓ Long term recommendation : Local Government must determine safety location away from landslide.

Landslide in Gaung village, Lubuk Begalung distric, Padang, West Sumatra.

The second experience of landslide mitigation conducted by LQRT was the case of Lubuk Begalung landslide. This landslide caused the death of 25 people, the highest amount of victims of landslide in 2005 in Indonesia. This landslide occured on September 2, 2005 in Gaung village, Lubuk Begalung district, Padang, West Sumatra. The type of landslide is debris slide that followed by fracturing. The landslide dimensions were as follow: length of 25 meters, width of 50 meters, height of crown of 2 meters. The situation of disaster area was encouraged by a steep hilly slope of 20º - 30º, as a bedrock was hardly tuffaceous and had weathered with a thickness of approximately 2 meters. In the lower slope was the Gaung village. The causes of the lanslide are the following: high amount of rainfall before the landslide during 2 days, steep slope, rareness of vegetation in the upper slope, the lithology consists of weathered tuffaceous creating a weak zone. Concerning the landslide suceptibility zone map of West Java created by CVGHM, the disaster area was a high suceptibility zone, meaning that in this area landslides can often be active in case of high rainfall or change of landuse. The landslide caused the death of 25 peoples 4 people were injured and 9 houses were destroyed.

LQRT has given the following recommendations to the Local Government:

- ✓ fill fractures in the upper slope with clay to prevent infiltration of water.
- ✓ plant deep rooted vegetation in the upper slope.
- ✓ In the long term, housings in this location must be relocated.
- ✓ be carefull during evacuation of the victims because of the accumulation of landslide material in the upper slope.
- ✓ put warning signs of landslide along the road from Teluk Bayur to Teluk Nibung.

Landslide Quick Response Team of CVGHM

1. Background

Indonesia lies on the tripple junction of three major active plates, namely : Eurasia, Indo Australia and Pacific. The concequences of this situation, making Indonesia vulnerable to geological hazard, created a topography of steep hills vulnerable to landslides. Landslide occurence is encouraged by high rain fall. One of the task and function of the Center of Volcanology and Geological Hazard Mitigation (CVGHM) is to conduct landslide mitigation. To support this program, the CVGHM has been conducted several research: monitoring of strategy area vulnerable to landslides, mapping of landslide suceptibility zone, socialization, building catalogue of landslide occurences in Indonesia, arranging guides for socialization, etc. Especially for landslide mitigation during occurence, the CVGHM has arranged teams of landslide quick response team.

2. Objective

The objective is to reduce the number of victims and the lost of property caused by landslide disasters.

3. Term/ Time Frame

Landslide response teams are continously responsible for monitoring landslide occurences in Indonesia and making reports to the head of CVGHM. Every landslide occurence, if possible, a team will go to the location of the earthquake disaster during approximately 7 days if it occured in Java island and 10 days if outset Java island.

4. Activities Undertaken

The landslide quick response team of CVGHM is responsible for giving technical recommendations during and after landslide to the Local Government and to conduct directly socialization to people and Local Government.

5. Major Achievement

The landslide quick response team of CVGHM achievement has been to make people calm, not panic and give technical recommendations to local government.

6. Total Budget

The total budget for landslide quick response team in the case of a landslide in Java island approximately amounts to Rp. 15 Millions and in case of outside of Java island, it approximately respresents Rp. 40 Millions.

7. Contact Detail

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Strengthening Local Government on Emergency Management and Contingency Planning for Earthquake and Tsunami Hazard, in West Sumatra Province (Indonesia).

Indonesia III

Big earthquake and tsunami disaster in Aceh and North Sumatera Indonesia on December 26, 2004 caused a large number deaths among the people and extensive infrastructure damage. This has shaken and raised our awareness to strengthen our capability and enhanced our capacity to deal with disasters. Furthermore, according to geologists and other earth scientists, the west coast of Sumatra Island was proven to be as an earthquake and tsunami disaster prone area. This region belongs to four provinces, namely Nanggroe Aceh Darussalam (NAD), West Sumatera, Bengkulu and Lampung.

One month after Emergency response in Aceh and Nias, the Government of Indonesia, in cooperation with many national and international agencies and organizations, held The National Post Tsunami Lessons Learned and Best Practices Workshop. The main goal of this workshop was to identify and evaluate the disaster management efforts that have been done in Aceh and Nias in order to get valuable lessons and good practices in the large scale of disaster handling. One of the recommendation that was raised during the workshop was to strengthen the capacity of local government as well as communities who live in the earthquake and tsunami prone area by preparing contingency plans.

BAKORNAS PBP, as the National Coordinating Board for Disaster Management is responsible to coordinate the implementation of ongoing contingency plan. Considering the limited budged and concerning the majority of the tsunami and earthquake prone region, at first, it was decided to conduct Emergency management and Contingency Training programs for West Sumatra, Bengkulu, Lampung, and East Nusa Tenggara. For this purpose, BAKORNAS PBP invited the participation of UN agencies to support this program.

Baiturrahman Banda Aceh Grand Mosque After Tsunami

Close to the end of the year 2005, BAKORNAS PBP had successfully conducted the training program in East Nusa Tenggara and West Sumatra Province. Beside, in the provincial level, in West Sumatra, the program had also been done at the district level, namely Pariaman, Padang City, Pasaman, Pesisir Selatan and Mentawai. In Padang city and Pariaman, considered as dense populated regions, the program had also been supplemented by evacuation drills and exercises in relation with tsunami disasters.

The expected goals of the training programs and workshops of each district/cities are as follow:

1. Produce new local trainers for Emergeny management and Contingency Planning.
2. Establish Contingency Planning for provinces and Districts/Cities of West Sumatra.

The number of participants of every single workshop was 35 people, composed of disaster managers at provincial level (SATKORLAK PBP/ Implementing Coordination Unit), disaster managers at District/ Municipality level called SATLAK (Implementing Unit), Military and police personnel, Academia, and Non Government Organizations.
The facilitators of the trainings are the practitioners, officers from government and non government. They are coordinated by BAKORNAS PBP in cooperation with Indonesian Society for Disaster Management (MPBI).

The Training and workshop program trained 210 persons in total, and at least 30 new local facilitators.

The program produced 5 contingency plans in the district levels and 1 contingency plan at the provincial level.
The total budget provided for the 6 (six) Districts/Cities in West Sumatra amounted to USD 99.000.

Workshop in West Sumatra

- Background
Following the tsunami disaster that destroyed Ache and North Sumatra on 26 December 2004, the Government of Indonesia gives special attention to the region along the west coast of Sumatra which is threatened by earthquake and tsunami hazard by strengthening capacity and awareness to the people and local government in that area.

- Objective
To strengthen the capability and awareness of the government and community in West Sumatra Province through workshops on emergency management and contingency planning for earthquake and tsunami hazard.

- Term/Time Frame
During 3 (three) months, from October 2005 to December 2005.

- Activities undertaken
To conduct workshops on emergency management and contingency planning for 5 (five) district levels (West Pasaman, Pariaman, South Pesisir, Padang City and Mentawai Islands) and 1 (one) province level (West Sumatra). The activity is conducted by BAKORNAS PBP, SATKORLAK PBP West Sumatra and 5 SATLAK PBP Districts, supported by United Nations (OCHA, WHO, WFP, UNDP, UNESCO).

- Major achievements
Each workshop is attended by 35 people. Today, 210 people have been trained. 30 new facilitators have been designated and 6 (six) contingency plans have been produced.

- Total budgets
USD 99.000

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Good Practices in the Merapi Prone Area: Communities Constitute Main Actors too

Indonesia IV

Merapi plays an extremely large role in the local community. This volcano has significant meanings, both material and spiritual, to the local community. Spiritually, it is believed that Merapi is a part of the axis of life interconnected with the south sea, panggung krapyak monument, Sultan palace, the tugu monument, and the volcano itself. On the positive side, the area surrounding the volcano is very fertile, and the body of the volcano provides a water reservoir.

On the downside, there are the eruptions that have the potential to damage the environment and claim human lives. The eruption on November 22, 1994 confirmed this. The unpredicted direction of the pyroclastic surge and the lack of preparedness on the part of the institution responsible, left 68 people dead, one lost and 23 with serious and minor injuries. Disasters are often seen as the inevitable result of Merapi's eruptions. As up to now, we are unable to manage this risk completely. Not only because of the exceptional force of the eruptions, but also because the timing of eruptions is difficult to predict. So, when Merapi erupts again, will there be more victims? Couldn't we more accurately examine various phenomena that have occurred in the past and re-assess our disaster management? Of course we can.

The pyroclastic flows and pyroclastic surges erupting from Merapi are directed towards the west and southwest areas. But deviations towards this direction are not unusual. The probability of deviations towards the north, northwest area, and south are close to 25%. Such deviations occurred during different periods of eruption in 1942 –1943, 1953–1957, and 1992 – 1997. Based on the experience of the eruption on November 22, 1997, the maximum limit of a deviant pyroclastic surge is 6.3 km. This is half the distance achieved by a 'normal' pyroclastic surge that occurred on January 7 – 8, 1969, which reached 9.5 km outside the river valley and 13.5 km in the river valley.

On February 10, 2001, we were in a state of chaos because Merapi "exhaled a breath" that reached 5.5 km in Sat River, with ash falling in Dukun, Srumbung, Salam, Ngluwar and Muntilan sub-districts. When Merapi erupted, the inhabitants of Kaliurang, Srumbung and Magelang were able to carry out an orderly evacuation. Inhabitants of the two most at-risk sub-villages, Kaliurang Utara and Sumber Rejo had evacuated to temporary barracks, long before the appropriate authorities took action. To build their capacity in conducting evacuations, the community had undertaken preparedness training. This was really a proactive action, which was produced by the community after the experience of series of disaster management trainings conducted by Disaster Research, Education & Management (DREaM) Working Group of National Development University Yogyakarta and KAPPALA Indonesia Foundation. This was done by more than 30 communities in the Merapi area, in eight sub-districts, in four regencies and two provinces. The aim of disaster management is to build a common perception. The source of threat is studied in order to determine an early warning system. Mapping is carried out to determine risk and assess capacity. Emergency relief skills and several methods of evaluation are studied in order to build preparedness capacity.

The training did not end there. Follow up was planned, and agreements got developed, and finally, implemented. The Turgo –Turi community already had an observation post full of communications and observation equipment, for a better early warning system. Family bunkers are also in the process of being constructed to supplement the existing communal bunkers. Realizing that the poor state of the roads hampers the evacuation process, the inhabitants of Kaliurang – Srumbung, on their own initiative, are improving the quality of the roads. The people of Kaliadem have agreed to form a preparedness team for tourists. Many other plans have also been agreed on.

In closing, we can look at what the inhabitants of Merapi feel: if they are not prepared, when Merapi erupts, the threat will result in a disaster, but in the end, these eruptions are an act of God. We must not forget that building capacity does not simply mean returning to normal so that we "are not hit with the same stone twice". Don't be dependent on others, if you can do it yourself.

Appropriate tools for evacuation of victims.

Fist aid training for preliminary school: try to help yourself

Background
The Merapi volcano in Central Java, Indonesia, is an active volcano which threatens the people living in its surrounding area. The area is situated in two provinces, Central Java and Jogjakarta. It is very fertile and densely populated.

Objective
To strengthen the capacity of the community living in the villages surrounding Merapi volcano, by giving them the best practice in disaster preparedness.

Term/Time Frame
Series of activities conducted since 2001 until present.

Activities undertaken
Risk mapping, disaster preparedness training, simple early warning systems, evacuation routes, and evacuation techniques.

Major achievements
Trained and skilled people, early warning system, evacuation roads, evacuation site and bunkers.

Total Budgets
p.m.

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Raising Earthquake Awareness of School Children : Experience of Indonesia

Indonesia V

Due to its geographic location within the zone of interaction of Eurasian, Indo-australian and Pacific tectonic plates, Indonesia is a seismic prone country. School children are among the most vulnerable groups toward earthquake hazard, due to the large number of school age population and vulnerability of the school buildings. To reduce the disaster risk of the school children, one of the non-structural mitigation option developed within the country is an education program to raise the awareness of the school children toward the earthquake hazard, where children can learn, in a more informal process within an extra-curriculum program, about what is an earthquake, what are its impacts on human life and human activities, what are the hazardous situations during an earthquake event and what can be done to protect oneself from such hazardous events, etc. The program is designed to provide earthquake awareness to school children through a series of children-instructor interaction, filled with fun exercises and games, to improve their understanding of the various issues related to earthquake preparedness.

To support the Indonesian elementary schools with the qualified instructors to run the program, a series of Training for Trainers (ToT) program had been developed and implemented. The ToT participants are selected among elementary school teachers from all over the country, in particular science and sport activities teachers, as well as (boy/girl) scout instructors. The ToT program was developed and implemented in the year 1999 to 2001 by the Bandung Institute of Technology (ITB), in collaboration with the Directorate General of Elementary and Secondary Education of the Ministry of Education, within the Indonesian Urban Disaster Mitigation Project as part of the ADPC- Asian Urban Disaster Mitigation Program. Support for the program came also from UNICEF and UNESCO. From the year 2002 onward, the program was redeveloped and improved by the Disaster Mitigation Center of the ITB and eventually adopted by the Ministry of Education as part of its Broad-based Education Life-Skill Program and became an annual training program of the Ministry which, until year 2005, trained more than 700 teachers/ instructors. The participants are selected among the elementary schools and local Department of Education officials in the earthquake prone cities and districts from all over Indonesia.

The objectives of the ToT program are :

- To provide the participants with the knowledge and understanding of earthquake hazard and its related preparedness activities and skills necessary to anticipate the hazard
- To provide the skills and guidance for the teachers in developing school earthquake preparedness action planning together with the school community
- To improve the skill of the teachers/instructors in disseminating the information and creating the awareness within the school community, and in particular preparing the school children for the possible earthquake events

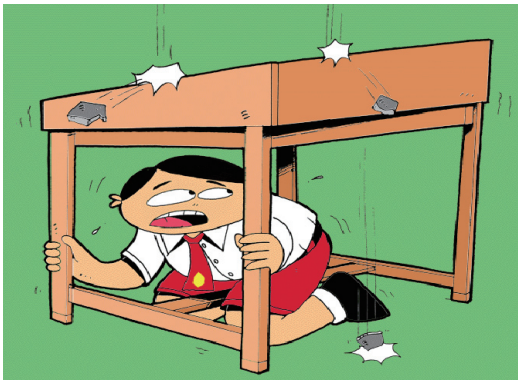
The benefit of the program includes improving the local community awareness and improved school safety, not only for earthquake hazard, but also for other type of natural (or man made) hazards (multi hazard approach). The training introduces an alternative approach to earthquake science teaching through various fun exercises and drills, which can improve the interest and understanding of the children to the substance and avoiding the subject from being boring or scary to the children.

Demonstrating vulnerable school building to participants

The content of the training includes introduction to earthquake hazard and its impact on society and in particular on the school environment, knowledge

and skills related to earthquake risk reduction in school community, from the point of view of school safety related to school buildings and school activities, and action planning process for school earthquake preparedness program.

It is expected that in the long run the ToT program will contribute to the school earthquake safety improvement through the improvement of the earthquake hazard awareness raising program in the elementary schools within the country.



Design of awareness material on earthquake protection drill for school children

Background:
Indonesia is an earthquake prone country and school children belong to one of the most vulnerable groups of the population toward earthquake hazard. Earthquake awareness program is required to be implemented nationally.

Objective:

- To provide the participants with the knowledge and understanding of earthquake hazard and its related preparedness activities and skills necessary to anticipate the hazard
- To provide the skills and guidance for the teachers in developing school earthquake preparedness action planning together with the school community
- To improve the skill of the teachers/instructors in disseminating the information and creating the awareness within the school community, and in particular preparing the school children for the possible earthquake events

Term/Time Frame:
Program development : 1999-2001, training implementation from 2001 onward

Activities Undertaken:

- Training of instructors for earthquake preparedness program in elementary schools

Major Activities:

- Awareness program development consisting of training curriculum and material development
- Pilot training
- Full scale implementation

Total Budget:

- About US $ 30.000 for the program and material development
- About US $ 15.000 per year for running the national annual training program

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Encouraged Nias IDPs in Sibolga Returning to Their Place of Origin through Grass Roots Level Training on Community Based Disaster Risks Management (CBDRM)

Indonesia VI

Series of strong earthquake of more than 7.0 on Richter scale have hit Nias island and North Sumatra. In various locations of Nias island high tide waves were seen, that many local people named local tsunami. No matter how big the magnitude and how high the tide were, many of the Nias people were traumatized and afraid to stay in their place of origin, especially those living along the coast, because many rumors saying that Nias island is like a cup floating on water when there is imbalance will drown. They were indications that it would likely to happen shortly, because part of some villages had already been flooded according to the villagers. In fact, most of the infrastructures in the island were damaged. As the result of this, many people moved out from the island. There were three main reasons for this: first of all, wrong understanding of the island's geological structure; secondly, trauma of tsunami tragedy that happened in Aceh and; thirdly, they have no shelter to stay as most of the houses had been damaged.

Other locations represented nearby cities in North Sumatra. Since December 2004 and January 2005, more than 650 people have been displaced to Sibolga, about eight hours by ferry from Gunung Sitoli, the capital of Nias District. They were accommodated in two temporary shelters; 350 people stayed in un-used SMK-PGRI building and 300 people lived in the tents located in Sibuluan village. Many more lived with relatives or host families scattered all over Sibolga. Unfortunately, no accurate data was available due to high movement of the IDPs and the local government did not recognize them as IDPs but rather as guests from Nias for their relatives or neighbours in Sibolga. Even five months after being displaced, they still haven't received minimum aids materials, neither from the government, nor from NGOs, as most of them has been focusing on Aceh emergency response and recovery. In May 2005, IIDP dispatched an assessment team. One of the findings was that the majority of the Internally Displaced People (IDP) had no idea about tsunami and earthquake, because in fact, no adequate information had been provided by local authorities.

In response to the situations and conditions above, IIDP, with the financial support of IOM Indonesia and ECHO, started providing basic information related to tsunami, earthquake, the dos and don'ts before and after its occurence, how to live healthy and comfortably in the camp. After discussion of this idea, it was concluded that a combined interventions should be done, not just by re-producing and distributing posters and flyers (IEC materials), but also by providing the communities with Community Based Disaster Risk Management (CBDRM) Training.

IIDP re-produced 7 types of posters and flyers with the following topics: Living healthy while displaced, Living comfort in temporary shelters, What has to be done for anticipating an earthquake, What has to be done during an earthquake, What has to be done after an earthquake or a disaster event, and finally, about Tsunami.

Special sessions on about earthquakes and geological conditions of the Nias island in parallel with the distribution of posters and flyers were given during the training. After knowing that the rumors saying that Nias island will drown in the near future was wrong, and acquiring a better knowledge about the earthquake phenomenon, local people became more confident and ready to return to their home land. By the end of June 2005, almost all IDPs confidently return to their homeland. There was only one old lady that till the last minutes, when the ferry was about to leave, did not want to join the group already on board. After intensive dialogue and using persuasive approaches, that lady finally got into the ferry with the group returning to their homeland.


The Children actively involved


The lactating women also involved

Program Profile:

Background: During that time, some institutions (both international and national) implemented livelihood activities through cash for work, farming, fisheries and other productive activities, but very few deal with disaster mitigation, community preparedness and distribution of IEC (information, Education and Communication) materials. IIDP believed that disaster mitigation and preparedness efforts were equally important as the emergency response and/or reconstruction efforts. Even in the long run, this effort will play a very significant role in anticipating such disasters and reducing the number of victims as long as people have adequate information about the hazards and its characteristics. Furthermore, people in the affected areas could recover from trauma and keep their healthy life as long as they receive appropriate information on keeping healthy when displaced, how to deal with trauma and other productive activities.

Objectives: **1. Encouraged IDPs of Nias in Sibolga to return to their homeland**
2. Developed local capacity on risks mapping, mitigation and contingency planning

Time frame: 3 weeks

Achievements:

1. Good IEC materials i.e. posters and flyers with relevant topics and easy to understand with high communicability could be effectively used for awareness building
2. CBDRM is one of the most effective approaches to build internal capacity, to analyze risks and to develop understanding of the people about their role in disaster management
3. Intensive facilitation from well-trained facilitators is one of key factors of success for local capacity building and improvement of people's awareness
4. In fact, the interventions made by IIDP with financial supports of IOM and ECHO is one of the factors that encouraged the displaced people to return to their homeland.
5. As a follow up of the Sibolga program, on September-December 2005, IIDP conducted CBDRM training at grassroots level targeting 1,000 local community members in Nias districts. It is hoped this kind of lessons learned could be replicated in other places.

Total Budget: US $10,000

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Insurance Program for Wind and Water Related Disasters in Korea

Republic of Korea

1. Background and Objective

Since the Korean Government began to support damaged private facilities in the 1960s, people's demand and hence the support coverage has kept increasing. People simply think that the government should compensate, not support, disaster damages more and more.

To minimize government's burden and citizens' moral hazard, an insurance program for wind and water related disasters was introduced. This insurance program aims to improve the current various support programs offered for free, to enhance the voluntary safety culture, and to reduce country's budgetary burden.

2. Target Coverage and Current Status

Based on the Natural Disaster Countermeasures Act, houses, green houses, and cattle sheds are selected as pilot objects that can be covered by the insurance, when those facilities are damaged by typhoon, flood, torrential rain, storm, wind, waves, and storm surge.

To promote the insurance program, nine local governments are selected and funded for pilot test. To estimate insurance rate and other basic insurance data, wind and water insurance management maps are produced based on the previous damages and future risks.

In June 2004 a draft for Wind and Water Related Insurance Act was proposed. In May and October, 2005 advanced notice for the Act was issued and the Act was reviewed by the National Assembly, respectively.

3. Future Direction

If facilities that have insurance coverage are damaged by natural disasters, the Government does not support the recovery costs of those facilities. Since the insurance program, however, is at the early stage and if a structure, which is supposed to have insurance and is not insured currently, is damaged, the support from the Government will bring support at a minimum level and the support will be reduced gradually to minimize the confusion.

Database systems that can compile various statistical data for object facilities will be established and managed by the National Emergency Management Agency (NEMA). Research on wind and water related disasters will be conducted to foster insurance business.

Central and local governments are encouraged to loan and support related budgets for target objects and to promote the insurance program with respect to recovery budget support.

The insurance program can be bought through ordinary insurance underwriters, agents, canvassers, and companies. It is also possible to sell the wind and water related insurance as a part of other insurances such as fire insurance and casualty insurance.

<Cattle Shed Damaged by Blizzard in 2004>
- Nonsan City, Chungnam Province -

<Damaged House by Landslide in 2003>
- Samcheok City, Gangwon Province -

- Background
People keep asking more compensation (not supported) when private property damage occurs

- Objective
To reduce government financial burden and minimize people's moral hazard

- Term/Time Frame
1997~2003: Feasibility Study
2004: Establishment of Wind and Water Related Insurance Act (draft bill) by Task Force
2005: First Reading in the State Council and referred to the National Assembly

- Activities Undertaken
The program is to be implemented in nine "pilot" local governments in 2006

- Major Achievement
Private owners are expected to take care of their facilities and houses more carefully and Government's budgetary burden is expected to decrease

- Total Budget
$5.9 million ($5.2 million from national budget and $0.7 million from local budget)

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Effectiveness of Fighting the Avian Influenza by Efficient Prevention Work

Mongolia

In connection with the death of birds and a newly developed situation, the National emergency management agency organized on 8th of August 2005 a working meeting by inviting leaders and specialists from the Ministry of health, the Ministry of food and agriculture, and the Department of state professional inspection, and the Central laboratory of the state veterinary and hygiene. We developed and implemented the next measures jointly with these organizations.

We confirmed the conclusions of laboratory analysis and took some measures to determine the subtype of the avian influenza viruses. We are conducting a survey by screening & monitoring in local areas, in order to have this epidemic under control. We analyzed a total of 205 dead wild birds' samples. From them, we discovered H5N1 viruses on 4 birds, which died in the lake of Erkel in Khovsgol province and in the lake of Khunt in Bulgan province.

In this case, we provided a professional instruction and recommendation. We also despatched a joint working group from the related organizations to the Khovsgol province in order to work on it.

We organized a work and took some measures to prevent the possible spread of the infection by issuing orders from the head of the Department of state professional inspection to prohibit temporarily the importation of birds and animals related products from China and Russia, which are connected to the foot and mouth diseases, as well as the avian influenza in both our southern and northern regions.

All of the 111 people and 4200 domestic animals around the lake of Erkhel in Khovsgol province have been vaccinated against the A type virus of the avian influenza.

We also took some measures to prohibit the use of water and the entrance of the domestic animals to the lake in which many birds died. The households were moved by 4 kilometers away from this lake.

(from the study issued by the Department of veterinary of the Ministry for food and agriculture, we find that a total of 10 economic entities and more than 2000 households are raising a poultry in the nation, which is equivalent to about 200 thousand birds)

We followed the policy about the vaccination of all the domestic birds in Mongolia in order to protect the population from the avian influenza. We also planned to buy 300000 doses of vaccine with the help of the fund given by the Government.

We screened the households around the Erkhel lake in Alag-Erdene soum of the Khovsgol province. During this screening, we extracted a sample from 5 children who complained of fever and cough. Then, we conducted an analysis on these samples by immuno chromatograf to detect the A B virus of avian influenza. But all the results were negative. We also conducted an analysis on these samples to detect a subtype of the A virus such as H1, H3, H5 and special variances of B type virus. But all these results were negative too. We provided 5 pieces of personal protection equipment, necessary medicine and feeding environment to the team who worked in Khovsgol province to gather, transport, and store the samples. We also received some personnel protective equipment from USAID.
The National center for research of communicable diseases delivered 250 doses of avian influenza prevention vaccine to Khovsgol province and immunized the population at risk. In addition, the National center for research of communicable diseases also delivered 100 doses of vaccine to the health center of Khovsgol province and vaccinated the people working in the poultry and pig farms.
During this time more than 600 migratory and wild birds died of avian influenza.

- Back ground:	There are no background. The avian influenza occurred for the first time in Mongolia.
- Objective:	to prevent the avian influenza from spreading from wild bird to domestic bird and from bird to human
- Term/Time Frame:	from August till November 2006 when all the migratory birds will be back to tropical countries.
- Activities undertaken:	Identification of viruses, decontaminations, establishment of a restricted zone and vaccination etc
- Major achievements:	prevent the avian influenza from spreading from wild bird to domestic bird and from bird to human
- Total Budget:	¥258 million
- Contact details:	T.Enkhbat specialist for health issues at the Operational Coordination and Management Division, NEMA phone: 263567 email: enkhbat@emer.pmis.gov.mn

Operation Lionheart

Singapore

Background

1. Since 1990, SCDF has a rotating overseas rescue contingent ready to provide assistance to countries in the Asia-Pacific region that have been hit by major natural or man-made disasters. Under the mission name of Operation Lionheart, the contingent is on a 24-hour standby and ready at 2 hours' notice to depart to the affected country. The contingent comprises over 40 personnel and is self-sufficient in terms of food, logistics and equipment for a duration of two weeks. The personnel are trained and equipped in accordance with INSARAG standardised guidelines for disaster response.

Major Overseas Missions Undertaken

2. So far, 8 Operation Lionheart missions have been undertaken as follows:
   a. Earthquake in Baguio City, Philippines – Jul 1990;
   b. Highland Towers Collapse in Kuala Lumpur, Malaysia – Dec 1993;
   c. 921 Earthquake in Taichung, Taiwan – Sep 1999;
   d. Asian Tsunami Disaster in Aceh, Indonesia – Dec 2004;
   e. Asian Tsunami Disaster in Phuket, Thailand – Dec 2004;
   f. Nias Island Earthquake in Gunung Sitoli, Indonesia – Mar 2005;
   g. Sumatran Forest Fires in Rokan Hilir, Indonesia – Aug 2005; and
   h. South Asian Earthquake in Muzaffarabad, Pakistan – Oct 2005.

3. In the past 2 years, Operation Lionheart contingents were deployed successfully on 5 ocassions and the details are as follows:

   a. Asian Tsunami Disaster in Aceh, Indonesia

      A total of 50 SCDF rescuers were despatched to assist in search and rescue operations in Banda Aceh for 12 days from 31 Dec 2004 to 11 Jan 2005. In total, they assisted in the extrication of 93 bodies. They also worked with the Singapore Armed Forces' (SAF) medical unit in the Refugee Relief Centre at the SECATA Camp which housed an estimated 2,000 people. They attended to patients, assisted in dispensing medicine and constructing drainage and sanitation facilities, as well as providing emergency behavior support for traumatized refugees and Bahasa Indonesia translation assistance.

Operation Lionheart contingent conducting rescue operation

b. Asian Tsunami Disaster in Phuket, Thailand

A 23-member contingent to Phuket was deployed for 12 days from 31 Dec 2004 to 11 Jan 2005 to conduct search and rescue (SAR) operations at the Khao Lak area, which comprised hotels and resort facilities. The damages at Khao Lak stretched for about 10km along the coast and 300m inland. The waves had destroyed buildings and uprooted trees, with many bodies trapped under debris and water. On 1 Jan 2005, the contingent was reinforced with an additional 57 rescuers. Search operations were also conducted at Charlie Beach Resort on Phi Phi Island. The search and rescue operations at Khao Lak included the conduct of joint air recce with the Republic of Singapore Air Force's (RSAF's) Super Puma and sea recce with the Royal Thai Navy. In total, the SCDF contingent extricated 14 bodies.

c. Nias Island Earthquake in Gunung Sitoli, Indonesia

On 29 March 2005, SCDF despatched a total of 40 rescuers to assist in SAR operations on Nias Island in the aftermath of a destructive earthquake. The contingent conducted search operations from 30 March to 4 April 2005, and was able to rescue two survivors and recovered 13 bodies from the earthquake-hit town of Gunung Sitoli. SCDF also provided relief supplies to the local community prior to the contingent's departure from Nias. Upon requests for equipment and expertise in debris removal by the Indonesian authorities, SCDF donated 15 sets of portable breakers valued at S$60,000 to them. SCDF also sent 2 Disaster Assistance and Rescue Team Specialists over to Nias on 8 April 2005 to provide training for the TNI personnel on the use of the portable breakers.

d. Sumatran Forest Fires in Rokan Hilir, Indonesia

On 18 Aug 2005, SCDF contingent consisting of 54 personnel was deployed to Sumatra to assist in tackling the widespread forest fires there. The contingent worked closely with the Land and Forest Division, Indonesian Ministry of Environment and local Polhut (Forest Ranger / Polisi Kehutanan) on the areas of deployment. Over a period of 4 days (19 to 22 Aug 2005), the contingent operated at 6 different sites comprising 3 wild land vegetation sites and 3 oil palm plantation fields. Portable pumps and jets were the main equipment used by the fire fighters to tackle these smouldering peat fires.

e. South Asian Earthquake in Muzaffarabad, Pakistan

SCDF deployed an overseas rescue contingent consisting of 44 personnel to Pakistan on 10 Oct 2005 to assist the local authorities in search and rescue efforts. During the 12-day deployment, the contingent operated under the umbrella of the Pakistani military as well as the UN On-Site Operations Command Centre (OSOCC). The contingent assisted in the provision of medical aid at a central Muzaffarabad base hospital as well as the heli-evacuation of quake victims from surrounding towns.

Operations in Muzaffarabad came to a close on 18 Oct 2005 when the focus of relief efforts shifted from short term relief operations to long term recovery work by humanitarian agencies such as the World Health Organisation (WHO) and the World Food Programme (WFP). In total, over 500 casualties were treated by SCDF personnel during their deployment.

Conclusion

4. SCDF will continue to undertake an active role in maintaining our operational readiness to respond to any major disasters beyond our shores, extending search and rescue assistance to needy countries in the region.

Contact details

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Rapid Emergency Assessment and Coordination Team – REACT

Tajikistan I

The Disaster Management Partnership in Tajikistan – Rapid Emergency Assessment and Coordination Team (REACT) was established in 2001 by UN OCHA and the Ministry of Emergency Situations (MoES) to promote the sharing of information, logistics and other resources between partners active in disaster management sector. Initially established to improve disaster response coordination, over the past few years the partnership has considerably expanded its activities, which now includes coordination efforts in broader disaster management areas, including community based disaster mitigation, hazard mapping and GIS. An indicator of the usefulness and success of REACT is the increasing number of partners, drawn from among international organisations, as well as from NGOs and Government. Presently REACT is constituted by 65 different organisations: 16 Government agencies, 7 donor organisations, 9 UN agencies, 28 International NGOs, and 5 local NGOs.

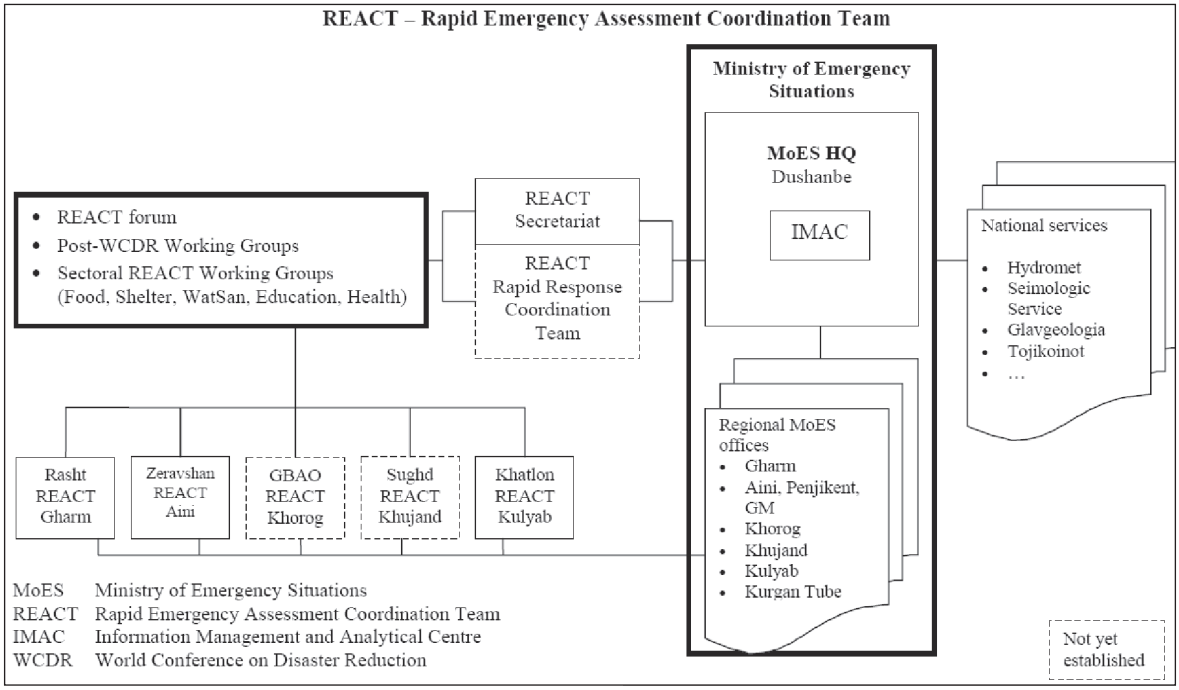
REACT has proved invaluable in mitigating, preparing and responding to recent disasters nationwide. Recently, during three major disasters in Tajikistan, July floods of 2004, heavy snowfall of February 2005, and floods of June-July 2005, the REACT partnership worked closely and in a very coordinated way to address the needs of the affected population during the emergencies and supported the local authorities in dealing with the impact of the disaster.

Within the REACT Parnership, 5 sectoral groups have been established to deal with: 1- Food Aid, 2- Non-food items, including shelter, 3- Health, 4- Water and Sanitation, and 5- Education. These sectoral groups are working towards developing strategies for effective preparedness and response in their specific areas. Their work feeds into updating of the Inter-Agency Contingency Plan for Tajikistan. A Rapid Response Coordination Group has been established within the partnership to reassure efficient disaster response. All information on all aspects of disaster management is shared on www.untj.org, where interested people or organizations can find up-to-date information on the overall situation in the country as well as recent disasters.

REACT partners are also working on the implementation of the outcomes of the World Conference on Disaster Reduction, 2005 – the Hyogo Framework of Action and supporting the Government in creating a National Disaster Preparedness Plan for Tajikistan.

In order to ensure effective coordination of disaster management activities in the regions, Regional REACT groups have been established in Rasht Valley, Zerafshan Valley and Kulyab zone. These regional coordination groups conduct regular meetings and carry out joint assessments of disaster affected areas.

REACT meeting in progress



Structure of the Disaster Risk Management Partnership in Tajikistan

Please give us the following information for readers to search.

- Background: Since 2001, the UN has been leading a disaster management coordination group formerly known as the Rapid Emergency Assessment and Coordination Team (REACT), which originally brought together the UN, NGOs and the Red Cross with the Ministry of Emergency Situations (MoES). Building on UNDP support, REACT has become the national Disaster Management Team, whose activities have expanded over the past year to include coordination efforts in broader disaster management areas, including community-based mitigation and hazard mapping.More information can be found at www.untj.org

- Objective: Establishment of a strong and unified coordination mechanism, which fosters national leadership and coordinates all international actors in the field of disaster management in Tajikistan.

- Term/Time Frame: 2001 – ongoing

- Activities undertaken: REACT established at capital level with a specific ToR; Five sectoral groups established, dealing with Health, Water and Sanitation, Non Food Items, Food, Shelter; Regional REACT teams established in 3 regions of the country; Monthly meetings conducted; REACT activated during natural disasters, responses were coordinated and timely assistance provided to affected population.

- Major achievements: Participation of more than 50 national state entities, local and international organizations in frequent REACT Forums. “One-stop” location for information collection and dissemination.

- Total Budget: approx. USD 20,000/annually

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Lake Sarez Risk Mitigation Project (LSRMP), Tajikistan

Tajikistan II

In 1911, a massive rockslide caused by an earthquake in the Pamir Mountains of eastern Tajikistan completely blocked the valley of the Bartang (Murghab) River, a headwater tributary to the Amu Darya river basin. Lake Sarez, which formed behind this landslide dam, now contains an estimated 17 km3 of water. Studies suggest that a major outburst flood from Lake Sarez would devastate human infrastructure in the Amu Darya river basin downstream from the lake in the Central Asian region, affecting as many as 5,000,000 people. The population most at risk from such a flood are those living in the first 540 km below the lake in the countries of Tajikistan and Afghanistan.

Taking this into account, the President of Tajikistan released an international appeal to address this issue. Following several missions and expert consultancies, Lake Sarez Risk Mitigation Project was designed and co-financed, using various sources and types of funds were arranged for the project. The World Bank and the Government of Tajikistan articulated an overall project framework, and responsibility for the overall implementation was assigned to the Ministry of Emergency Situations and Civil Defense (MoES) of Tajikistan.

The goal of the project is to reduce vulnerability to a potential major flood in valleys of the Bartang and Pyanj rivers of Tajikistan and to reduce the risk of flooding in other Central Asian countries.

The target area of the project is the vulnerable communities situated in the 540 kilometers along the Bartang river in Gorno-Badakhshan Autonomous Oblast (GBAO) and Pyanj river in the south of Tajikistan, all the way from Lake Sarez to Hamadoni District (former Moscowski) of Khatlon Oblast. The Bartang and Pyanj rivers flow through populated narrow valleys down from the Usoy Dam to Hamadoni District. At that place, the Pyanj River widens. However, a USACE model developed in 1998 indicates that a worst-case flood would form again beyond the wider valley areas, so that the very fast-moving flood crest would still be 5 meters high at the town of Termez on the Uzbekistan/Afghanistan border some 1400 kilometers below Sarez.

The project has four components, which include:

- **Design and installation of a monitoring and warning system.** This system will be able to (i) sense the beginning of an outburst flood or a substantial increase the danger, and (ii) send a signal that will trigger alarms in the most vulnerable villages below the dam, and (iii) provide long-term data needed to understand better the technical options for reducing the likelihood of a flood.
- **Social training and safety related supplies.** This part is also known as the Social Component.
- **Studies to assess possible long-term solutions** to the Sarez outburst flood hazard.
- **Institutional strengthening.** Consultants' services, incremental operating costs and equipment to strengthen the capacity of the GoT organizations responsible for implementing the project.

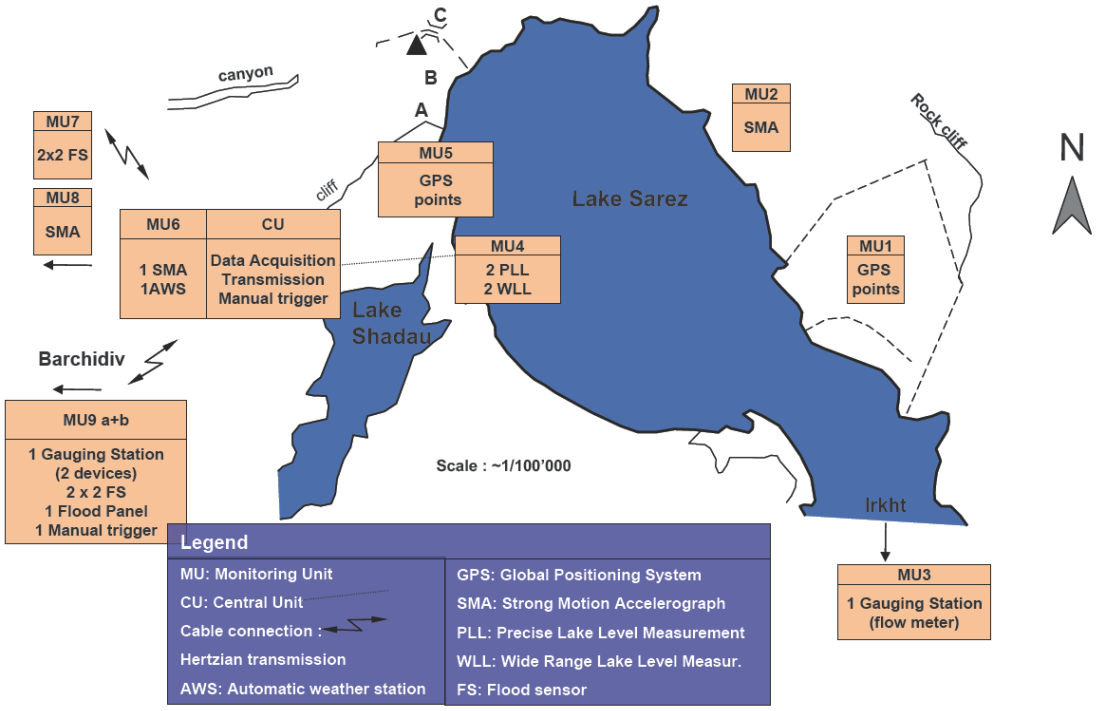
Lake Sarez

The Project is an excellent example of expertise and ownership within a government institution - in this case the Ministry of Emergency Situations. The Usoy Department that now bears full responsibility for

operation and maintenance of a technologically sophisticated monitoring and Early Warning Systems (M&EWS) has considerably improved its capacity and is quite capable to take care of the system in the future.

In general, the LSRMP is geared to achieve its development objective, which is to help alert and prepare vulnerable people in case of a disaster associated with an outburst flood from Lake Sarez and other frequent natural hazards such as mudslides, rockfalls, avalanches and seasonal floods. One indication of this is the situation faced by the Usoy Department on 14 July 2005, when the early warning system issued an alarm level 1 at the Usoy Dam due to the raising of the water level by more than 25 cm within 24 hours, which was detected by the real-time monitoring system.

The sketch of the EWS & MS measuring devices



Please give us the following information for readers to search.

- Background: Lake Sarez Risk Mitigation Project (LSRMP) was initiated by the Government of Tajikistan and supported by International Community in order to reduce the risk of outburst of Lake Sarez. The lake was formed by a massive rockslide caused by an earthquake back in 1911. Lake Sarez contains 17 km3 of water, and is considered to be a threat to five million people living in Central Asian countries, especially in Tajikistan and Afghanistan. The lake is located in the eastern part of Tajikistan, in Pamir Mountains of Gorno-Badakhshan Autonomous Oblast. More information can be found at www.sarez.tj

- Objective: Reduce vulnerability to a potential major flood in valleys of the Bartang and Pyanj rivers of Tajikistan and to reduce the risk of flooding in other Central Asian countries.

- Term/Time Frame: December 2000 – December 2005

- Activities undertaken: (i) A comprehensive risk assessment and community preparedness, as well as training activities have been successfully completed; (ii) Installation of the monitoring and early warning

systems in Lake Sarez was completed in December 2004; (iii) The Usoy Department within the Ministry of Emergency Situations and Civil Defense has been established and is in charge of the operation and maintenance of the systems. Its staff have received training and continue to be trained on the operation and maintenance of the systems; and (iv) A study on long-term solutions was completed in March 2005, which makes recommendations for a medium-term mitigation plan for Lake Sarez.

- Major achievements: Vulnerable communities trained and preparedness plans developed; A real time monitoring and early warning system installed; MoES staff trained at all levels to use and maintain the system

- Total Budget: USD 4,290,000 mln. (Government of Tajikistan USD 0.17 mln, Government of Switzerland grant USD 2.9 mln, USAID grant USD 0.25 mln, Aga Khan Foundation grant USD 0.5 mln, International Development Agency USD 0.47 mln);

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Community-Based Evacuation System

Thailand

Tambon Khuk Khak of Takua Pa district, Phang Nga province

Before December 26, 2004

1. Background

Nestled amidst coastal shoreline of Andaman Sea and mountain range covered with tropical forest, Tambon Khuk Khak of Takua Pa district, Phang Nga province, Thailand has naturally endowed with scenic surroundings such as beautiful beaches and serene tropical forest. This natural endowment has attracted thousands of tourists near and far to visit this bustling town. Tambon Kunk Khak is composed of 7 villages with 4,704 inhabitants or 2,594 households. Fishery and off – shore aquaculture activities have long been the sole major source of income among the majority of the inhabitants. Until very recently, tourism related activities have become other sources of income generation. Hundreds of hotels and resorts, shops and restaurants have been erected to accommodate and to cater the influx both foreign and local tourists. Consequently, the standard of living and livelihood of the people have been better off.

After December 26, 2004

Then came, the most devastating natural disaster, the Indian Ocean Tsunami of 26 December 2004. Within minutes, 300 lives of native inhabitants were lost and missing, 556 houses and 72 hotels and resorts, livelihoods, infrastructure were destroyed, setting back hard – earned development gains for decades.

2. Objective

(1) To develop the model of systematic, standardized and community – based tsunami evacuation system.

(2) To be knowledge – base venue where everyone can visit and learn about systematic, standardized and community – based evacuation system.

3. Component of the Model

So as to prevent and reduce the impact of potential disaster particularly the tsunami, Puan Pung Pa Voluntary Foundation (Thai Red Cross Society), Phang Nga local authorities and community members and Department of Disaster Prevention and Mitigation had integrated and developed the model of community based tsunami evacuation system at Bang Niang village, Tambon Khuk Khak Ta Kua Pa district, Phang Nga province. This community-based evacuation system model comprises 5 components as follows;

(1) Evacuation building that can accommodate 200 persons with the area of coverage within the radius of 500 meters from the building. Besides, this building will be equipped with facilities, equipments and food that meet the standard requirement.

(2) Warning tower. This tower has been fully equipped with modern and appropriate devices for receiving and disseminating warning information.

(3) Evacuation route maps and signs with the symbols and inscription in English and Thai.

(4) Parking area and traffic routes around the evacuation building.

(5) Life jackets and other basic necessities.

Besides, the management of evacuation system has been laid to ensure the effectiveness of the system in the face of emergency. This evacuation system management comprises 8 parts;

(1) Rapid and safe evacuation system

(2) Maintenance system of evacuation building and evacuation routes

(3) 24 – hour information receiving and disseminating system

(4) Security and road traffic system

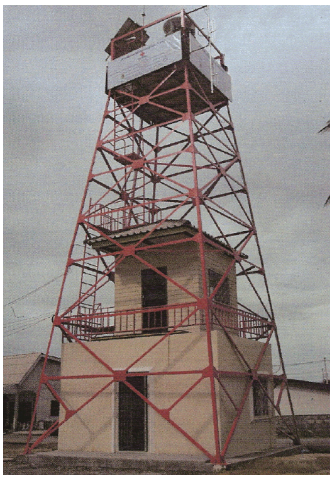
(5) Catering and basic necessities distribution system

(6) Evacuee registration system

(7) Health and environment surveillance system

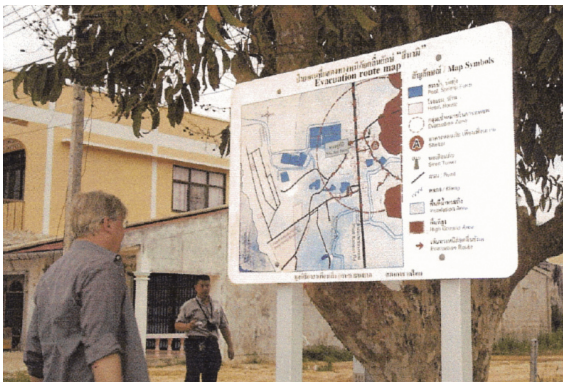
(8) Evacuation drill system

(9) Public participation preparation system



Warning Tower

Bang Niang villagers preparedness approach (CBDRM) with ADPC



Evacuation Route Map

Evacuation Building Place

4. Implementation Guideline

4.1 Department of Disaster Prevention and Mitigation (DDPM) had been assigned to shoulder the responsibility of 2 abovementioned parts (part (1) and part (8)), which can be elaborated as follows;

4.2 DDPM and ADPC (Asian Disaster Preparedness Center) jointly launched the community – based disaster risk management (CBDRM) activity at Bang Niang village to put public participation preparation system into gear. Through this CBDRM approach, the people in the community had the chance to fully participate and make the decision in mapping the evacuation routes, locating safety areas etc. Besides, the awareness and preparedness among the general public had been created, and the community leaders were well equipped to be the safety guides.

5. Achievements

Bang Niang community-based tsunami evacuation model has been launched since August, 2005. Many activities have been materialized and can be elaborated as follows;

(1) Provincial Evacuation Action Plan has been formulated and approved by provincial governor in a capacity of Provincial Civil Defense Commander. This evacuation plan comprises 5 main components:

- Legal framework
- Objectives
- Implementation Guideline
  - Division of Responsibility of Core Agencies
  - Supportive Agencies and NGOs
- Target Group of Evacuee
- Implementation Procedure
  - Pre-Disaster Phase
  - On-Going Phase

(2) Local authorities, NGOs and community jointly conducted the evacuation drill on 16 December, 2005. Approximately 2,000 persons and 1,000 observers participated in the drill. Such a drill will be carried out twice annually to ensure the effectiveness of evacuation procedure, to maintain the awareness and preparedness of all stakeholders, and to improve the deficiency in the procedure.

6. Conclusion

(1) The people of Bang Niang village has fully participated in developing this community-based evacuation system model. Their intervention started from formulating evacuation plan through the evacuation drill, which is compatible with public participation principle, think together, plan together, activate together and evacuate together.

(2) Bang Niang village community-based evacuation system will serve as the role model of all stakeholders' intervention to sustainably achieve the 8 – systems – objectives; (a) community participation system, (b) warning information system, (c) warning information dissemination system,

(d) volunteer system, (e) security system, (f) evacuation building management system, (g) disabled evacuee assistance system, and (h) tourist evacuation system.

Budget

1. Evacuation building : 5 million Baht (125,000 US dollars)
2. Warning tower : 900,000 Baht (22,500 US dollars)

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