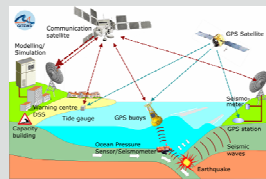


Capacity Building in Local Communities

German-Indonesian Cooperation for a Tsunami Early Warning System

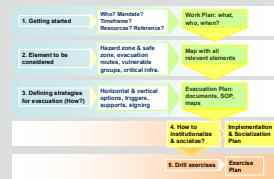
GITEWS annual meeting 2009 |

02



Concepts for Evacuation Planning |

08



Indian Ocean Wave 2009 |

10



Fishermen & buoys |

11



- 03 | The project's core processes
- 04 | News from the Pilot Areas
- 07 | Our partners: BPBD Padang
- 09 | Hands on training in Bali
- 12 | GITEWS within GTZ

Editorial

Evacuation of people in risk areas is the first priority once a tsunami early warning is received or natural warning signs indicate the imminent arrival of a tsunami wave. As the time span between a warning and the impact of a tsunami wave in Indonesia is generally very short, all necessary preparations should have been made in advance to ensure that as many people as possible get a chance to evacuate. An official evacuation plan is essential to provide the community with the necessary reference, guidance and information. Furthermore individual, neighbourhood and institutional evacuation plans are needed to ensure that everyone is able to act independently and as quickly as possible in case of emergency.

Official evacuation plans, maps and signs need enforcement through local government policy. Local policy should also define the authority to call for evacuation, and the dissemination process to local institutions and the public. Although official evacuation planning is a task for local authorities, the planning process requires the participation of all relevant actors including local decision makers, emergency responders, disaster management experts, and community representatives.

In this issue of the newsletter, we provide an insight into ongoing discussions and evacuation planning processes in the GITEWS Pilot Areas.

Best regards
Harald Spahn, Team Leader GTZ IS-GITEWS



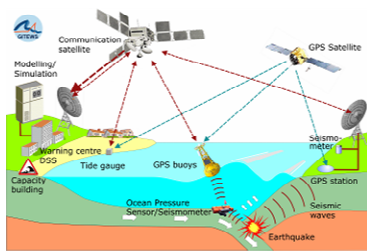


Participants of the 2009 GITEWS Annual Meeting, in Potsdam, Germany



GITEWS Annual Meeting, May 2009
 This year more than 140 people took part in the GITEWS (German Indonesian Tsunami Early Warning) Annual Meeting held on 18 -19 May at the GFZ German Research Centre for Geosciences in Potsdam, Germany.

Scientists, technicians, graduates and PhD students as well as partners and guests from Germany, Indonesia, Madagascar, Sri Lanka and India were invited to discuss the progress they have made and to present their results. Difficulties and delays, and consequences arising out of delays, were also discussed. Besides the technical, practical and scientific aspects of the operation of the tsunami warning system, its sustainability in Indonesia was also discussed.



The GITEWS Concept

Progress so far...

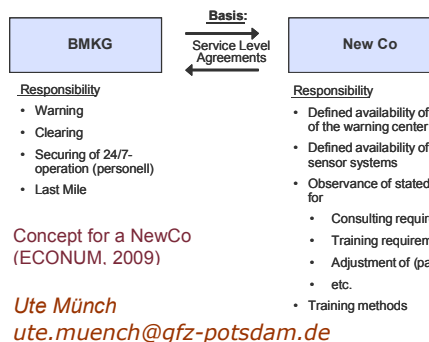
The Tsunami Early Warning System was inaugurated by the Indonesian President in November 2008. The system includes a seismological network, together with GPS stations and a network of GPS buoys, ocean bottom pressure sensors, and a tide gauge network. Most of the sensor stations have been installed and now deliver data either online or by request to the warning centre in Jakarta. Software and hardware components have been installed and are partly operative. Before March 2010, however, the interaction between the components must be improved and optimized, personnel need to be trained, and problems arising in day-to-day operations have to be dealt with.

Operation & maintenance

After the end of the GITEWS project in March 2010, Indonesia will be responsible for the maintenance, repair, spare parts supply, software update, the multifarious trainings, and the education programme.

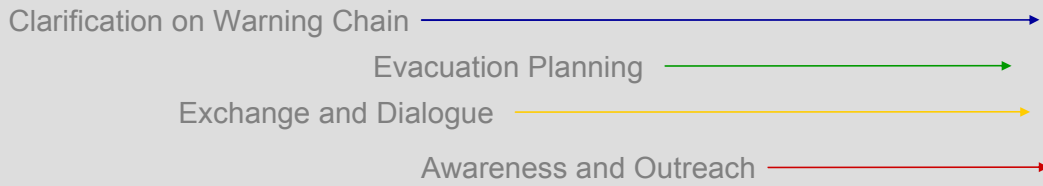
Although some educational activities were realised within GITEWS, additional support and ongoing transfer of knowledge from Germany will be still necessary for some time.

To assure the German and/or international support and to guarantee the permanent independent operation of the warning system, the idea of setting up an operating an operating company ('New Co') in Indonesia is being considered. The operating company and subcontractors would be responsible for maintenance, software updates, and spare parts supply. In this model, BMKG would then be responsible for tsunami warning nationwide. Under this scheme, 'New Co' would be able to raise additional funds and offer services to additional customers. Also being discussed is the establishment of a UNU-EHS twin institute in Indonesia, to continue the educational programmes. Just as important as the training is the so-called last mile: extension of the programme to a broader area.



Milestones as of March 2010

- 2nd Quarter 2009
 Additional hardware installation at BMKG and the National Coordination Agency for Surveys and Mapping. Buoy maintenance with Baruna Jaya. Relocation of the Hub and the central antenna to the new building. Shipment of ocean bottom units (OBUs) to Indonesia. Installation of four more seismic stations.
- 3rd Quarter 2009
 Operational readiness of the Decision Support System (DSS) at BMKG. The DSS will publish tsunami warnings based on seismic information and the simulation results. Deployment of the OBU and PACT systems with Baruna Jaya
- 4th Quarter 2009
 Preliminary test version of DSS handling all the sensor information (seismic, GPS, tide gauges, buoy-systems), getting back a simulation result. Installation of two more GPS stations.
- 1st Quarter 2010
 Test of the fully functional version of the DSS. Deployment of the last two buoy systems with Baruna Jaya. International tsunami training course in Jakarta Installation of three more tide gauges. Operational readiness of the fully functional DSS at BMKG



Focus on Core Processes and Products in the remaining nine months

Nine months to go: core processes and products

The *Capacity Building in Local Communities* project runs until the end of March 2010. For the remaining time, besides other activities, the project will focus on four core processes and products: further clarification of the tsunami warning chain, development of a clear step-by-step approach for tsunami evacuation planning, an exchange program that facilitates dialogue between local and national players, and awareness-raising and outreach activities.

The Tsunami Warning Chain

As highlighted on many occasions, the stakeholders of InaTEWS agree that the so-called last mile is crucial for the effectiveness of the entire tsunami early warning system. Achievements in the technical upstream part of InaTEWS will have no impact without a clearly defined warning chain (from the warning centre to the coastal communities).

Following several drill experiences and discussions at local and national level, considerable progress has been made towards the clarification of roles and responsibilities within the warning chain and the definition of standard operating procedures as a vital tool for decision making and dissemination. In follow up to the 4th National InaTEWS Stakeholder Roundtable, a writing team for a national warning chain guideline (consisting of BNPB, BMKG, LIPI, DKP and GTZ) has been established and is currently working on a first draft that will soon be presented to national InaTEWS stakeholders.

The project actively supports this process, and also plans to support its partners in the dissemination of the guideline to other tsunami prone areas in Indonesia. For this purpose, GTZ proposes a national workshop at which representatives from tsunami prone areas can meet, receive information, and discuss their strategies and experiences.

Evacuation Planning Guidebook

Having an evacuation plan in place when a tsunami warning comes in is crucial for effective preparedness and quick reaction. Based on experiences in all three pilot areas, GTZ (in cooperation with DLR) is currently working on a guidebook for evacuation

planning at province, district and community level. Evacuation planning is the task of local authorities. The guidebook will provide local planners with a step-by-step approach to developing appropriate strategies and maps.

Exchange and Dialogue

The authorities of districts and provinces neighbouring the project's pilot areas can benefit from the experience of their colleagues and neighbours (inter-district cooperation). Horizontal dialogue between them will support knowledge transfer and prepare the ground for a long-term cooperation in tsunami and disaster preparedness along the coastline of Java, Bali and West Sumatra, and build tsunami prepared communities. The project also supports exchange across the three pilot areas and with national level institutions – a dialogue that is vital for an end-to-end warning system. The aim is to bring local and national stakeholders closer together to exchange information and experience.

Awareness and Outreach

Awareness is a prerequisite for any preparedness strategy. Visual tools have proven to be very effective means for community outreach activities aimed at raising peoples' awareness. Therefore, the project has produced a video for grassroot level outreach. As a stand-alone, self-explanatory product with a wide reach, the video will be an instrumental tool for outreach campaigns by government and non-government organizations. The other component of awareness raising is a Training of Facilitators Manual, which will train members of civil society organizations to work with community-based facilitators.

A comprehensive compilation of all project outputs

The project has produced a series of outputs. These products range from working documents, guidebooks, and checklists, to training and operation manuals and awareness and educational materials, including posters, comics and videos. These documents present the experiences of the project in the pilot areas, and the results of discussions with partners at national and international level.

Upon request of its partners, GTZ IS-GITEWS will develop comprehensive documentation of the project outputs and materials, presenting them in a way that will enable and motivate partners and others to use them as tools and information sources when further developing tsunami early warning and preparedness initiatives in other areas in Indonesia.

The final documentation is also expected to contribute to the dissemination of the Indonesian experiences to other countries around the Indian Ocean area and beyond.

This so-called Project Kit, which will incorporate all project outputs, will be disseminated to all stakeholders at the end of 2009.

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Kuta beach / Dialogue with local community in Kuta / Meeting with Bali Governor

News from the Pilot Areas

Bali

Besides the evacuation planning processes in Kuta and Tanjung Benoa, the development of an official framework for tsunami early warning policies and procedures in the province of Bali had been the focus during the last few months. As part of the capacity building process, a hands-on training on tsunami risk assessment methodologies for evacuation planning was implemented by DLR, DKP and GTZ (see feature on page 9).

Evacuation Planning in Kuta

The evacuation planning process in Kuta is implemented by an inter-institutional working group, led by the National Unity and Community Protection Agency, in the district of Badung. The members of the working group include representatives of various governmental institutions, NGOs, universities, and the local community.

A dialogue with representatives from Kuta community was held on 1 June to discuss the ideas of the working group and to collect further input and ideas. The main outputs from the meeting were:

1. Agreement to establish two zones for evacuation: red zone (warning level 1) and yellow zone (warning level 2)
2. Nomination of representatives from Kuta community to join the inter-institutional working group
3. Cooperation with South Kuta Beach Business Association (SKBBA)

During a subsequent meeting with the SKBBA committee, the basic ideas of evacuation planning development in Kelurahan Kuta were presented. The SKBBA committee expressed its full support for the idea and proposed socializing it to all managers of the association.

DAPS Training

LPMP Bali Province conducted a second training on disaster management basics to primary school teachers who teach geography. The training was conducted in cooperation with the Bali Province Education Department and GTZ.

The general objectives of this training were to improve the teachers' geographical knowledge about natural disaster and to motivate them to pass on their knowledge to their students. The overall aim of the training is to improve school awareness of risk reduction, mitigation, and preparedness.



The training, which included a simulation exercise, was based on the DAPS curriculum, incorporating local, Bali-specific topics. Facilitators for the five-day session came from PMI Bali Chapter, BMKG, Kesbang and GTZ.

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Provincial Regulation on TEWS

To provide an official framework for tsunami early warning policies and procedures, a provincial regulation has been drafted by the TEWS Bali working group. The regulation is based on the concept document developed by the TEWS working group and GTZ.

The regulation will establish provisions on TEWS – related issues such as the official tsunami hazard map, the roles of province and districts, and decision-making procedures in the Disaster Response Command Centre (Pusdalops).

The concept document, updated tsunami hazard map, and related technical documents were handed over to the Governor at a meeting on 18 June. The Governor expressed his support for the provincial regulation and asked the working group to carry on with the process. He also indicated that the new Provincial Disaster Response Command Centre would be inaugurated at the end of August.



Next steps

Finalising the evacuation strategy for Kelurahan Kuta and documentation of the evacuation plan in Tanjung Benoa (MoUs, SOPs, maps). The draft of the Provincial Regulation on TEWS needs to be discussed and socialized to all tsunami prone districts in Bali.



The opening of Workshop XII; Mr Mujiharto (BNPB) and Mr Banu Subagyo (UNSCDRR). The Round Table Meeting opened by Mr. Rusdiyanto; Mr Sugeng Triutomo (BNPB)

Java

A series of meetings in the Java pilot area have reinforced the activities planned for Phase 2. The focus will be on further implementation of TEWS components at the community level, and inter-district cooperation. Recent discussions with the communities from the target villages in the districts of Bantul, Kebumen and Cilacap have also provided useful lessons learned from last year's experience.

Workshop XII

Implementation of Phase 2 activities in the Java Pilot Area of Java was preceded by Workshop XII, held in Cilacap on 12-13 May 2009 and opened by Mr. Eddy Hidayat (Assistant 1). Aside from the members of the three working groups, representatives from the private sector from Cilacap and Ciamis (West Java) were present. Topics discussed included a review of the achievements of phase 1, the planned activities in phase 2, and the latest developments in InaTEWS. Mr. Mujiharto (Director of Community Empowerment at BNPB) highlighted the change in paradigm from response to preparedness orientation, as well as national policies and institutions in disaster management. Mr. Banu Subagyo (UNSCDRR) shared the experience of the 'Merapi' inter-district cooperation.

In late June, a series of visits and meetings with the local facilitators and the representatives of the communities in the three districts followed. The GTZ IS GITEWS team in Java gathered some useful stories from communities during the implementation of phase 1 activities. Discussing those findings with the district working groups resulted in an agreed proposition for Phase 2 activities.

The new initiative of inter-district cooperation is another interesting topic to be carried out in Java. The future experience of this initiative is hoped to offer examples of project replication to neighbouring districts and for cooperation with related institutions at the provincial level.

Regional Round Table Meeting

On 27 May 2009, a regional Round Table Meeting was hosted by the Provincial Government of Yogyakarta, and facilitated by BGR. It was the first of four similar meetings planned by BGR and selected district/provincial governments. The meeting was opened by Mr. Rusdiyanto (National Unity and Community Protection Agency Yogyakarta), and discussed the tsunami warning chain and the implications for the institutional aspects, e.g. Disaster Response Command Centre and the Provincial Disaster Management Agencies (BPBD). The outputs of the meeting will contribute to development of the national warning chain guideline that will be published by the National Disaster Management Agency (BNPB).

Central Java BPBD and the districts of Cilacap & Kebumen (Central Java), Kulon Progo, Bantul and Gunung Kidul (Yogyakarta) were represented at the meeting. From the national level were representatives from the State Ministry of Research and Technology, BNPB and the Ministry of Home Affairs.

Amongst the interesting topics discussed was inter-district cooperation and the possibilities for building linkages between disaster management agencies at the district, provincial and national levels. A communication mechanism for enabling these links was discussed.

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Some changes in the Pilot Area

Along with the inauguration of the new BPBD, Cilacap has assigned 27 people to its current working group, including several former members. Kebumen added 12 new members to its working group. The re-structured Bantul working group now has 15 members.

Test of Technology

Two warning receivers have been installed at a mosque in Karang Gadung village and in Logending tourist area in Ayah village in Kebumen. Both were successfully tested.



A siren installed in Logending tourist area in Ayah Village, Kebumen being tested.

Next steps in Java

Workshop XIII is scheduled to be held in Pangandaran, Ciamis, in mid July. Representatives from Cilacap, Kebumen and Bantul, together with GTZ IS GITEWS, intend to pay visits to the neighbouring districts of Ciamis (West Java), Purworejo (Central Java), Kulon Progo and Gunung Kidul (Yogyakarta) to learn more about their interest in implementing tsunami early warning systems in their respective communities.



Community socialization / P3DM workshop for the private sector / workshop on the role of journalists in disaster management

Padang

Padang Disaster Management Agency (Padang BPBD) has been established and started operations. Stakeholders in Padang are now in the process of creating the legal framework for tsunami early warning operations and preparedness. Tsunami Alert Community (KOGAMI) is extending its work into public-private partnership activities. Another highlight was the identification of existing and construction of new buildings for vertical evacuation.

Legal Frame for Tsunami Early Warning in Padang

To strengthen implementation of tsunami early warning in Padang, TPS-PB as a conceptor of disaster management in Padang, has developed a draft mayoral regulation on Tsunami Early Warning (TEW) implementation, which is now going through the legislative process.

Many aspects, including the capacity of the Regional Disaster Management Agency and the Disaster Response Command Centre to implement the mayoral regulation, need to be considered as part of the legislative process.

A main reference for the regulation is the national warning scheme. According to the plan, the decision support system (DSS) will be integrated to the tsunami early warning system at the national level in August 2009. This will have implications for tsunami early warning response and SOPs at the local level, and for implementation of the tsunami early warning function of the disaster response command centres. Therefore, the policy makers and stakeholders involved in drafting the mayoral regulation on TEW have decided to postpone final approval of regulation decree until the system at the national level has been finalized and the references clearly defined.

After the national warning scheme has been finalized and published, the team will meet again to make necessary revisions and continue the legislative process.

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Training & Workshop for Private Sector

The Tsunami Alert Community (KOGAMI) in cooperation with Mercy Corps is running a programme called Public-Private Partnership for Disaster Management (P3DM). The programme involves a series of activities, including disaster awareness for local communities and construction of infrastructure that complies with disaster risk reduction and design policies. This is a participatory program involving local communities, government, schools, and the private sector.

The Tsunami Alert Community, Mercy Corps and Indonesian Business Association conducted a meeting in April 2009 with business people from West Sumatera Province to involve them in disaster risk reduction activities and also to inform them about the P3DM programme.

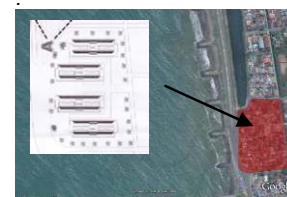
The interest shown by the businesses attending the meeting in being involved in internal and external disaster risk reduction activities formed the basis for the Disaster Risk Reduction Capacity Building for the Private Sector training and workshop, which aims to build private sector knowledge and capacity in disaster risk reduction.

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Development of Apartments suitable for Vertical Evacuation

Padang provincial government, with support from public works, is building four twin apartment blocks in July 2009 will build 4 twin apartment blocks in Purus Village, as accommodation and for vertical evacuation in the of a tsunami.

The first phase of the development will involve construction of two, four-storey twin blocks, with top stories specially designed for evacuation purposes.



Padang government has provided a 1.7 ha of plot of land for construction. Each apartment block will have the capacity to accommodate 96 households, so the four twin blocks will be able to accommodate around 3,200 people in all.

This figure, however, covers only 0.6% of the 500,000 people living on the coastline of Padang city. Therefore, Padang government will continue with its efforts to gather national and international support to provide vertical evaluation in all tsunami prone areas of Padang.

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Next Activities in Padang

Based on the agreed working plan, follow up activities will include: (1) Completing the warning dissemination system, (2) Finalising the draft of mayoral regulation on Tsunami Early Warning, upon finalisation of the national early warning scheme.



The new BPBD building / recharging the batteries / ...no operational vehicles available yet...

Padang City Disaster Management Agency: lacking equipment but tirelessly serving the people

Padang Disaster Management Agency was established at the end of January 2009. Implementation of all InaTEWS related processes previously by the Social Welfare and Disaster Management Agency (DKS-PB2) have now been transferred to this new agency.

Padang City Disaster Management Agency (Padang BPBD) is one of the local government agencies under the coordination of the National Disaster Management Agency in Jakarta. The person in charge of the operations of this disaster management body, located in Pasar Ambacang village, is Mr. Dedi Henidal, a highly disciplined former member of the Indonesian military.

As its name suggests, Padang City Disaster Management Agency is responsible for disaster preparation and response measures at all stages, regardless of the scale of the disaster. In the event of disaster, it is the agency's responsibility to coordinate all task forces in Padang.

To support its work, Padang City Disaster Management Agency cooperates with national and international organizations, including the Indonesian Red Cross, Inter-Community Radio (RAPI), Amateur Radio Organization of Indonesia (ORARI), Tsunami Alert Community (KOGAMI), and other community organizations.



An international organisation that plays a critical role in supporting the agency's tsunami early warning is the German organisation GTZ. Padang is one of the pilot areas of the GTZ GITEWS programme, represented in Padang by Willy Wicaksono.

The agency's staff also have the support of 36 volunteers, who are divided into three groups. These volunteers are also act as the search and rescue team, and are on call 24/7, ready to respond to disasters.

Like disaster management agencies in other areas, the one in Padang has a Emergency Command Centre, equipped with communication and information technologies, such as Ranet and Rabab, to keep local communities informed.

The command centre has a crucial role to play in the event of disaster. All the task forces operate under the coordination of the command centre and must obey all instructions they receive from the centre. So it is important that the command centre



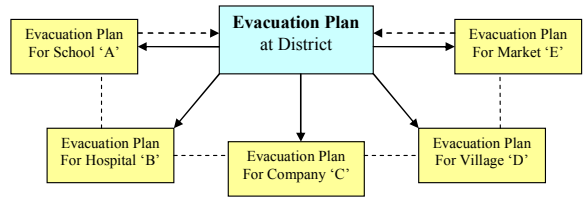
has sufficient personnel who are capable of operating all the equipment.

The Padang City Disaster Management Agency is in the early stages of development. Even although all the personnel are ready for action, they do not yet have the equipment they need to carry out operations in the field. The agency lacks vehicles, communication radios for field personnel, and other essential field equipment.

In response to the recent cyclone in Lubuk Kilangan sub-district, disaster management agency staff had to use their own vehicles, including motorbikes, for operations and to distribute aid. The situation was far from ideal; but whatever the situation, the team remains dedicated to its work. The concern is that under current circumstances, delays in support and aid to disaster locations are inevitable. But the Padang City Disaster Management Agency staff and volunteers are motivated by the fact that they come from the communities that they tirelessly work to serve.

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Traffic jam during an evacuation / evacuation planning is needed at different levels / evacuation drill in a school

Concepts for Evacuation Planning

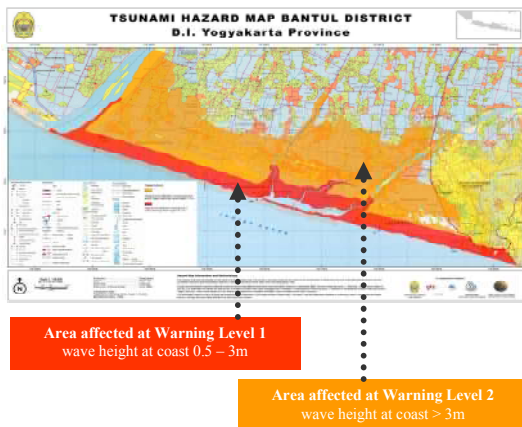
Evacuation of people in risk areas is the first priority once a tsunami early warning is received or natural warning signs indicate the imminent arrival of a tsunami wave. As the time span between a warning and the impact of a tsunami wave in Indonesia generally is very short, all necessary preparations should have been made in advance to ensure that as many people as possible get a chance to evacuate.

New challenges for evacuation planning

The 2004 tsunami represented a new dimension to the concept of a “worst case scenario”. The implications for evacuation planning are challenging, because the area affected by the 2004 tsunami was up to ten times larger than that affected by any historically documented tsunami in Indonesia, with the exception of the Krakatau event. Evacuation planners in Indonesia currently face dilemma in terms of (1) probability, as the worst case is a very rare event – but it happens; (2) affected area, as a complete evacuation of the entire affected area considering 2004 as the worst case scenario is not realistic and (3) short warning times due to the nature of local tsunamis.

Tsunami evacuation planning for different warning levels

Another challenge for evacuation planners lies in the fact that INA-TEWS is set to introduce two warning levels. In theory this might be the clue to solve the dilemma related to the “worst case scenario”, as decision makers will not necessarily have to call for full scale evacuation if the threat is a minor one. A two zone approach can be useful to avoid “over-evacuation”. On the other hand, the question arises of whether a two-level evacuation strategy is a realistic option if it comes to implementation and communication at community level.



↑ Evacuation planning for different warning levels

The 5 steps of an evacuation planning process →

Tsunami evacuation planning & self-protection arrangements

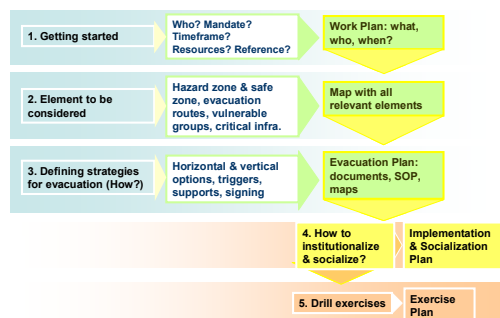
Due to the extremely short warning times for local tsunamis, self protection arrangements play a vital role. Not much guidance or support by emergency responders should be expected during the tsunami evacuation process. Therefore all the necessary steps have to be taken in advance to enable and support the community at risk to protect themselves, whether at home, at the work place, or in public areas.

Local governments should encourage and support the development of individual, neighbourhood and institutional preparedness plans, and provide the necessary references to do so. An official tsunami evacuation plan is possibly one of the most important references for this kind of preparation, provided that the plan is easy to understand, and widely distributed and known. The ability of people in risk areas to recognize and understand natural warning signs as well as early warning messages also needs to be strengthened.

Community based disaster management programs can play an important role in strengthening self protection arrangements, especially when they are backed up with adequate information from local government about local plans and procedures. The more vulnerable segments of the local society (children, elderly people, schools, hospitals, etc.) need to be addressed specifically and receive adequate support.

Last not least, the evacuation planning process itself is just as important as the final plan, as it helps to create the necessary knowledge and networks to respond to an emergency.

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Trainers and participants of the training in Bali



A first hands-on training on tsunami risk assessment methodologies for evacuation planning was given to support the local evacuation planning working group. Creating knowledge about conducting risk assessments and understanding their results for the purposes of evacuation planning was the focus of the training. This was an important initial step towards implementation and sustainable use of risk information for disaster management.

Training on evacuation modelling in Kuta

On 2-4 June 2009, a first hands-on training on tsunami risk assessment as a contribution to evacuation planning was conducted in Denpasar, Bali by GTZ, DLR and DKP. The main objective was to train participants on GIS methodologies for evacuation modelling and to support the working group in Kuta. The aim was to enable the participants to produce and update their own maps for evacuation planning based on a consistent technical approach.



Attending the training were participants with a range of expertise, from Udayana University, Indonesian Red Cross, DKP, BMKG, Regional Development Planning Agency, National Unity and Community Protection Agency, and IDEP.

The main challenges are to identify a focal point for technical evacuation planning in Kuta to adopt a consistent approach to evacuation modelling and to harmonize map products and base data from the various institutions in order to provide consistent products to support local evacuation planning.

Vertical evacuation assessment

To support local evacuation planning activities in Kuta, a methodology for vertical evacuation modelling was developed by DLR and DKP to answer decisive planning questions:

- 1) Is there enough time to reach an evacuation building before the tsunami wave arrives?
- 2) Is the capacity of the evacuation building sufficient to accommodate all people reaching the building?
- 3) Is there a need for more evacuation buildings?

The basic principle of the approach is to calculate the time needed to evacuate to the nearest evacuation building, taking into account the parameters that have an effect on people's evacuation speed. A flat road, for example, allows faster evacuation speed than dense vegetation.

The building capacity might also be a limiting factor for evacuation. Hence, the decisive information for evacuation planning is the number of people who are able to evacuate (1) in the given time or (2) until the building concerned has reached its maximum capacity.

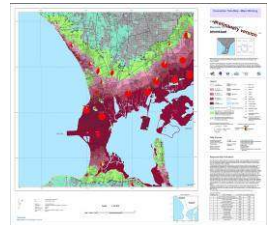
Based on this spatial information, difficult-to-evacuate areas will be visualized to support decision making on further evacuation planning activities, such as additional evacuation buildings.

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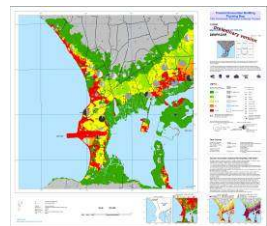
Outcome of the first training on evacuation modelling in Kuta

Together with the training participants, the first mapping products for evacuation planning were developed.

Based on the hazard map for Southern Bali the evacuation capabilities of the population were assessed.



The main product was an "evacuation time map", showing the evacuation situation in Kuta based on current knowledge of existing tsunami evacuation buildings and safe areas for horizontal evacuation. Knowing the estimated time of arrival of a tsunami and the time needed for evacuation is essential for evacuation planning.



Key information, such as detection of difficult-to-evacuate areas, where to place additional shelters and of what capacity, and suitable evacuation paths can be derived and used for evacuation planning.

Next steps

To ensure a sustainable process in the technical support for local evacuation planning, a second training on evacuation modelling will be conducted in July. Project results in the field of tsunami risk assessment will be made available for the use in local disaster management strategies. The application of risk assessment results for early warning chain development, socialization and contingency planning are the next steps beside the contribution to evacuation planning.



Presentation at the Ministry of Home Affairs / Presentation at the Indonesian Institute of Science to local government of Aceh / Meeting at BMKG

The Indian Ocean Wave Exercise 2009 (IOWave09)

The IO Wave 09 aims to test the inter-operability of different tsunami early warning systems in various Indian Ocean countries, evaluate the warning issuance by national warning centres, and motivate countries to test and review their response procedures (SOPs) for warning dissemination.

As the warning services from the Indian Ocean Tsunami Warning System have been operational for several years now, the Intergovernmental Coordination Group – Indian Ocean Tsunami Warning and mitigation System (ICG-IOTWS) under coordination of IOC UNESCO decided to test their warning services through the Indian Ocean Wave Exercise 2009 (IOWave09). This decision was made at the 5th ICG IOTWS meeting in Putrajaya Malaysia. An IO Wave 09 task team was formed, with representatives from Indonesia, Thailand, Australia, Kenya, Thailand, Malaysia, Srilanka, and France.

IOWave09 offers the member states of ICG-IOTWS three scope options. The first is to test only the issue and receipt of warning dissemination by the Indonesian NTWC to member states; the second covers decision-making by member states regarding dissemination of warnings to the public; and the third option, which includes decision-making followed by public reaction and emergency response exercises. The IOWave09 will take place on 14 October 2009, to coincide with International Disaster Risk Reduction Day. The scenario will simulate a re-enactment of mega event of the Aceh earthquake and tsunami.

Chairing this task team, Indonesia has made the preparation for these system interoperability tests, circulated confirmation forms through the ICG Secretariat, and developed country preparedness for the event, from it National Tsunami Warning Centre (BMKG), as the focal warning service provider to national and local disaster management agencies. A series of local and regional workshops on SOPs and the role of the media will take place prior the event.

Indonesia, along with India and Srilanka, has confirmed that it will take part in the full -scale public evacuation exercise. Banda Aceh will be the host of the event.

Roadshows to government institutions were conducted in April and May. The IOWave09 task team has met with the National Disaster Management Agency, Ministry of Communications and Information, National Planning Agency and the Ministry of Home Affairs, which have all indicated their support for the exercise.

The first official meeting with the Nanggroe Aceh Darussalam Provincial Government took place in Jakarta on 22 May 2009. The Aceh government expressed its support and commitment to jointly organizing the Indian Ocean Wave Exercise 2009 in Aceh, and will appoint an IOWave09 committee at the local level.

The SOP workshop in Aceh will overview the existing SOPs on InaTEWS (if any) or develop SOPs. A sharing session on development of SOPs, drawing on experiences from Bantul, is part of the agenda.

The Regional SOP Workshop will evaluate NTWC SOPs for producing, updating, and evaluating messages; exchange information on SOP among member countries; define means of communication among NTWCs; and develop evaluation forms (including from observers) for the IOWave09 Exercise.

The media workshop will provide an opportunity to discuss the further role of media in tsunami warning dissemination.

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Planned events in preparation for Indian Ocean Wave 2009:

13-16 July 2009
SOP Workshop for DMO in Banda Aceh

22 July 2009
First media workshop in Jakarta

10-14 August 2009
Regional SOP Workshop in Jakarta

14 September 2009
Tabletop Simulation in Jakarta

12-13 October
International Symposium on Earthquake and Volcano (side event) in Banda Aceh

13 October 2009
Stockholm Environment Institute (SEI Bangkok) and ADPC event in Banda Aceh

14 October 2009
Indian Ocean Wave Exercise





Fisher boat approaching a buoy / damaged buoy / entangled nets

Tsunami buoys and local fishermen: a story of interaction

GFZ German Research Centre for Geosciences, Potsdam, Germany

In April this year, a further eight GPS-buoys were deployed along the Indian Ocean coastline off Sumatra and Java, by the German research vessel SONNE. Two old buoys deployed 15 months ago had to be recovered during the sortie.

The towers of the recovered buoys, equipped with GPS, meteor sensors and solar panels had been used by fishing boats as – from their point of view – perfect anchorage. After a couple of months the mechanical stress was so great as to bend the tower, preventing data from being transmitted to the tsunami warning centre.

Function of the buoys in the TEWS

Off-shore measurements of sea level changes play an integral part in the tsunami early warning system, because not every strong earthquake causes a tsunami. To avoid costly false alarms it is essential to have the sea level data available in the warning centre.



Recovered buoy / redesigned buoy

The buoys are equipped with modern GPS receivers and additional sensors and are able to independently measure the sea level to an accuracy of better than 5 cm under a wide range of sea state conditions. Today, the buoys are able to provide data in less than five minutes to the warning centre.

In addition, the buoys receive and transmit data from PACT (pressure based, acoustically coupled tsunami detector) units, which were derived from the well-proven US Dart system. PACT units record ocean bottom pressure, perform on-board tsunami detection, and acoustically relay the data to the surface buoy.

The recently deployed buoys have been redesigned and now have a fairlead to avoid uncontrolled anchoring. It would be preferable for fishing boats to keep their distance from the buoys to avoid their nets being entangled in the mooring.



PACT unit



Poster with information on buoys (BPPT)

Keep in mind that the tsunami buoy is important for the tsunami early warning system. The information about whether a tsunami has been generated saves lives!

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In order to better distinguish between tsunami induced pressure changes and earthquake induced pressure changes, and for a better estimate of source parameters from offshore earthquakes, some of the buoys will be connected via an acoustic link to bottom stations. These stations are equipped with a broadband seismometer, a hydrophone and a pressure sensor. In case of a sudden pressure change of more than 3 cm, a tsunami alarm is generated by the bottom station and sent to the buoy, from where it will be transmitted to the warning centre.

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GITEWS within GTZ

“**Developing security – securing development**” is the GTZ spotlight for 2009. Although the focus is on conflicts and crisis, it is recognized that prevention of natural disasters shall be part of the security discussion. The GITEWS project is highlighted on the GTZ website as one of the reference projects illustrating GTZ activities in this field of work.

Developing security **|||||||**
 ||||| Securing development
 – 2009 –

The GTZ topic of the year "Developing Security - Securing Development" was also the central theme for the annual **Eschborn Dialogue**. Organised by GTZ on 23-24 June 2009, this event brings together international and national experts from politics, the private sector and civil society. Again, natural hazards as a security threat were discussed, especially with regard to climate change.

Our project, CIM colleagues Horst Letz & Michael Guenther (at BMKG), and Alex Kesper (BUDPAR/BHA) have been portrayed in a series of photos in the **GTZ Annual Report** as an example of a successful cooperation between CIM and GTZ. It also reflects the positive perception of the GITEWS project within GTZ. The profile can be found on pages 14-21 of the report (See: <http://www.gtz.de/en/publikationen/686.htm>).

From 29 June to 1 July, the **GTZ Network International Cooperation in Conflicts and Disasters** (NICD) met in Oberursel, Germany. The GTZ Disaster Preparedness Team is associated with this network, which is a forum of disaster management related projects and representatives from GTZ Headquarters. One of the major topics the group discussed and exchanged experiences on was disaster preparedness as a public service – which is highly relevant in the context of early warning systems, as well as adaptation to climate change. It is well recognized that disaster risk reduction is a major element of adaptation to climate change.

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The Eschborn Dialogue Logo



GTZ Annual Report



GITEWS-Portraits in the GTZ Annual Report 2008
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