

## Capacity Building in Local Communities German-Indonesian Cooperation for Tsunami Early Warning System

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### Editorial

The Mentawai tsunami on 25 October was another reminder to move on strengthening tsunami preparedness. Many people asked why, despite the many efforts in recent years to improve preparedness at community level and the implementation of the Indonesian Tsunami Early Warning System (InaTEWS), once again a tsunami could claim several hundred victims. First assessments showed that the people on the islands did not get a “clear message” from nature because they did not feel a strong earthquake. And although a tsunami warning from InaTEWS was sent out within five minutes after the earthquake, it did not reach the communities at risk on time. For further background information, have a look at the feature on page 9.

After more than four years, the GITEWS Project “Capacity Building in Local Communities” is now coming to an end. Looking back, it has been a very intensive experience which involved many institutions and individuals in developing, implementing and testing new concepts and practical tools for tsunami early warning and preparedness at community level in the pilot areas. With this last edition of the Newsletter we would like to thank all partners and stakeholders involved for their fruitful cooperation.

Germany will continue to support Indonesia in the field of tsunami early warning in the upcoming years. Preparation of a follow up project is underway. As the results and experiences from the GITEWS Pilot Areas have been evaluated positively, the upcoming project will also offer further assistance for the “downstream part”.

Best regards  
Harald Spahn, Team Leader GTZ-IS



Challenges for InaTEWS: warning chain gap / Mentawai assessment meeting at BMKG / Final meeting of the project in Jakarta

### Learning from experience

The Mentawai tsunami, as every other tsunami or tsunami warning in the past years, was analyzed thoroughly to extract lessons learnt and to improve the system. The results were discussed in Jakarta on the 8<sup>th</sup> December. Two days later, the Final Project Meeting, was another opportunity to share experiences from the project and the challenges on the way ahead.

#### Meeting at BMKG: the Mentawai Tsunami

Representatives from the InaTEWS and GITEWS project met in Jakarta to discuss the lessons learned from the Mentawai tsunami of 25 October. The group analyzed the response of the InaTEWS, the timeline and decision making up to the cancellation of the warning. Later, the GITEWS team presented the preliminary results on the earthquake parameters and mechanism. GTZ contributed with an analysis of the preliminary results from assessments in Pagai and Padang on the reaction of decision makers and communities to the earthquake and early warning and its possible implications for InaTEWS.

It was concluded from the analysis that although TEW probably cannot be considered as an option for the Mentawai Islands due to the short lead time (around 10 minutes) – it clearly highlighted current bottlenecks in InaTEWS. Although the warning message from BMKG was disseminated via public TV just 7 minutes after the earthquake – which is an excellent achievement – there is nevertheless still a major gap in the warning chain. The Mentawai experience confirmed that warnings reach the province and district institutions but there is no guarantee that these warnings are translated into evacuation orders or passed on to the community at risk by the local authorities. This can be explained by the lack of understanding of their role in the warning chain, limited capacities, missing procedures, and limited technical infrastructure for warning dissemination.

#### Final Project Meeting in Jakarta

During an evening event, the project team and representatives from national and international partners celebrated the official closure of the GITEWS project “Capacity Building in Local Communities”.

Mr Pariatmono (RISTEK) and Mr. Lauterjung ( GITEWS project management) highlighted the importance of the “downstream” part for the overall success of InaTEWS. They also acknowledged the role the project played in continuously advocating this issue and in generating practical experiences in the pilot areas.

The GTZ team presented the TSUNAMIKit, which is a recently published compilation of the experiences of the project. An online version is also now available at: [www.gitews.org/tsunami-kit](http://www.gitews.org/tsunami-kit).

The meeting also addressed the remaining challenges for further implementation of InaTEWS at the community level. Beside the need to strengthen the capacities of local governments to assume their role in early warning and community preparedness, just as important is fostering a common understanding of the system, its services and limitations.

The participants agreed that after having made considerable advances in the upstream part of the system, the focus should now shift to ensuring that warnings reach the communities at risk and that people and local institutions are enabled to translate them into action.

The meeting was closed by Mr. Prih Harjadi from BMKG.

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#### The follow up project

Preparations for the follow up project are underway. Based on the discussions with national partners, a concept note has been developed to outline the objectives and fields of activities for further cooperation in the downstream part. According to this concept note, the new project will provide support to national government institutions, local governments and civil society actors to strengthen capacities for the provision of services necessary for sustainable tsunami preparedness.

The following fields of activities within this project had been proposed:

1. Development of national standards, instruments and procedures for community-oriented tsunami preparedness
2. Horizontal and vertical exchange of experiences and knowledge transfer
3. Strengthening of community oriented tsunami risk management
4. Support for the further development of warning products and practice of InaTEWS in accordance with the needs of the end-users
5. Academic/scientific monitoring and knowledge management

The project will operate on national level and build up on the existing networks in the pilot areas.



Mr. Tatto Suwanto Pamuji, Cilicap Deputy District Head, Mrs. Sri Surya Widati, Bantul District Head, and Mr. Joko Waluyo, Head of BPBD Kebumen participated in the tsunami drills in their respective districts

## Java

Accomplishment of some final activities closed the fruitful four-year cooperation project in PA Java. The consistent enthusiasm of the local partners made the implementation of the final activities possible. The achievements of the project in PA Java have laid important foundations for the local partners and the communities to continue the implementation TEW towards building resilient communities in each area.

### Evacuation Planning

Based on the recently produced tsunami hazard map, the partners in Ciamis developed an evacuation plan for the district. The process followed the steps prescribed in the *Guidebook for Local Authorities and other Stakeholders in Indonesian Communities*, produced by the project.

Two meetings with the local stakeholders and field visits were carried out by the assigned local team in November. As a result, the first draft of the district evacuation map and evacuation procedures was developed based on the data and information contributed by the subdistricts. The drafts still need to be completed before they are presented to the local stakeholders for input and finalisation.

Purworejo, meanwhile, postponed the plan to develop an evacuation plan but intend to begin the process in early 2011. The working groups from the other districts made themselves available for consultation and assistance during the process of developing the evacuation plans for Ciamis and Purworejo.

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### Tsunami Drill

The districts of Cilicap, Kebumen and Bantul conducted tsunami drills in each of their pilot area on 25 November. This exercise was initiated by interest of the local partners and local authorities at the district and provincial levels. The drill was intended to exercise the community response plans developed for, and the dissemination equipment installed in, the villages of Widarapayung in Cilicap, Ayah in Kebumen and Samas in Bantul. The plan to run a simultaneous exercise in the three districts was not possible due to a delay in one of the districts.

In Cilicap, the drill involved many people, including that vice district head, military, police, Indonesian Red Cross, and key local stakeholders. It was observed by the Governor of Central Java and other institutions from the province. Similarly, in Bantul, the district head, the head of local parliament, military, police, SAR and other local stakeholders participated. In Kebumen, the BPBD, military, police, navy, sub-district authorities and SAR took part in the drill.

In addition to the local working groups, in Bantul, personnel from BNPB and military HQ participated voluntarily as external observers. The process was documented for future improvement. The exercises provided important learning points for the three districts.

### Closing Workshop

The GITEWS project in the PA Java was officially closed at a three-day final workshop held in Yogyakarta, on 2 – 4 November.

The workshop was arranged to allow the partners from the five districts to reflect on the project achievements to date, and to look ahead to future tasks at the local level. The event also enabled sharing of local experiences with participants invited from neighbouring districts and provinces along the south coast of Java. Please see the article on page 4 for details of the closing workshop.

### What's Next in PA Java?

Having looked back the work done in the last four years, the partners in PA Java were pleased with the achievements of their own efforts. Good models, local expertise and networks as the basis for continuing their work now exist in the districts.

However, they are aware that there were still much to do to build a robust response capacity in their communities, which will require all segments of the community playing an active role.



Evacuation planning meeting in Ciamis / The EOC in Cilicap / Evacuees in Bantul during the tsunami drill / Closing remarks by partners



Mr. Murprih Antoro Nugroho of Yogyakarta Civil Defence opened the workshop / Presenters from RISTEK, BMKG & BNPB./ Mr. Samsul Maarif, Head of BNPB briefed participants at Yogyakarta EOC / Mr. Harald Spahn, GTZ IS GITEWS Team Leader handing out tsunami kits to one of the participants.

### Closing Workshop in PA Java

After a four-year implementation of Capacity Building of Tsunami Early Warning for Community in the Pilot Area of Java, the project had come to an end, and it was closed officially in the sixteenth workshop held in Yogyakarta from the 2<sup>nd</sup> to the 4<sup>th</sup> Nov 2010. The closing event provided good opportunities to the local Partners and GTZ IS to reflect on the achievements to date and to look forward to the continuation and future optional efforts for the local. The other neighbouring districts and provinces lie along the south coast of Java were also benefited from sharing of experiences with the key national and local actors.

### Internal Workshop

Aside from closing the project, this final workshop was held to serve two purposes: to review the four-years achievements in the 5 districts with the project Partners in an internal workshop (2<sup>nd</sup> November) and to share experiences and to observe results with the representatives of the neighbouring communities in Java (3<sup>rd</sup>-4<sup>th</sup> November).

In the internal workshop, Partners and GTZ IS reviewed achievements in each of the five pilot districts using the same Checklist applied for the assessment and the monitoring of the project. Some progresses achieved and other aspects found in the project in the last four years were highlighted and discussed. The latest tsunami experience in Mentawai (25<sup>th</sup> October) was also reviewed and used to reflect on the actual current preparedness level in the pilot areas.

At the end, Partners listed some recommendations as follow-up actions for the communities, the district and provincial governments, and also for the national actors. Specifically for the PA Java, four points were suggested: i) to complete the remaining tasks in implementing local response capacity in each district, ii) to strengthen Tsunami Forum, iii) to continue replications of the experiences in other risk areas in Java, and iv) to offer local experiences for national interests.

### External Workshop

The Head Yogyakarta Civil Defence opened the workshop, which was attended by participants representing the local governments of most adjacent districts and provinces on the south coast of Java, other organisations and educational institutions involved in disaster management, and the local partners of GTZ IS.

The morning session was spent updating participants on the latest development of the upstream components implemented by InaTEWS. The topics were delivered by four presenters from RISTEK, BMKG and BNPB. The presentations led to further discussion. In brief, participants emphasised the importance of strengthening links to enable smooth flow of information along the warning chain from InaTEWS NTWC at BMKG to the people at risk, and of extending national support to the regions to accelerate the implementation of community capacity response.

During the afternoon session, representatives of the provinces of Yogyakarta and Central Java, the pilot district and the community shared local experiences in implementing TEW. This session generated an interest among external participants in accelerating initiation of TEW components in their areas.

### Field Visits

On the last day, the participants went on a field visit to the local EOCs in Bantul observed a test of the siren installed at the SAR post in Parangtritis, and visited the Yogyakarta province EOC. The first two visits showed participants how the local tsunami warning chain works at the community level, the tasks of the local authority and the people, and the communication equipment utilised. The final visit demonstrated to the participants the role of provincial EOCs in TEW.

Participants also had the chance to meet and talk with the Head of BNPB who was leading the emergency response to the Merapi eruption. The observations and discussions during the visits complemented the learning gained on the previous days.

The closing workshop was conducted amidst the intense response to the impacts of catastrophic Merapi eruption. Despite this, the workshop ran well and benefited all participants.

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Partners reviewing project achievements / Participants of internal workshop



Erecting tsunami information signboards in Kuta / Evacuation sign in Kuta / Meeting in Tanjung Benoa

### Pilot Area Bali

A joint review of the achievements in Pilot Area Bali was carried out in early October. The district and provincial working groups applied the tsunami early warning checklists to analyze the current state of tsunami preparedness in their respective areas and what still has to be done. Local facilitators continued implementing community information events in Sanur and Kuta. Building on past accomplishments, other project activities included installation of a radio communication network and erecting tsunami evacuation signboards and signage along Kuta beach.

### Erection of tsunami evacuation signs and signboards in Kuta

To provide information about tsunami evacuation routes and procedures in Kuta to the public, the project supported Badung district with the development and erection of five tsunami information signboards, showing the official evacuation map and the agreed evacuation procedure, as well as 13 evacuation signs indicating escape routes. In addition, leaflets in Indonesian and English have been designed and printed to be distributed by the local stakeholder.



The Deputy Mayor of Badung district symbolically erected one of the signboards and evacuation route signs. The event was witnessed by community leaders, and representatives from government, the private sector, and associations of service providers on Kuta beach. The deputy mayor said that he hoped that the erection evacuation signboards and signage would have a positive impact on tourist development in Badung district, with the signs providing basic guidance for evacuation in the event of a tsunami warning making visitors feel more at ease. He also used the occasion to thank the GITEWS project for its support with the development of tsunami early warning in the pilot areas.

### Radio network linking tsunami prone areas

As radio communication has proved to be a reliable method of communication during emergencies, the project supported the installation of five VHF radio units in five villages participating in the pilot project in Badung and Denpasar districts. Each village received one base station and a mobile unit (HT). The radios link the villages directly to the provincial Emergency Operation Centre, which provides warnings and guidance to the Balinese communities in the event of a tsunami threat. The EOC transmits on 165-300 MHz, which national policy designates as a frequency dedicated for emergency communication.



### DVB in PUSDALOPS

The provincial Emergency Operation Centre in Denpasar is now equipped with digital video broadcasting (DVB) linked to the BMKG National Warning Centre. The connection was set up by the regional BMKG office in Bali. The Bali Province EOC is also linked to the Disaster Management Information System (DMIS) and Disaster Action Update Network (DAUN).

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### Final Meetings in PA Bali

#### In Tanjung Benoa

A meeting in Tanjung Benoa was held to follow up the MoU on evacuation procedures between the community of Tanjung Benoa and hotels in the area. The meeting was attended by community leaders, village heads, and representatives of the village administrations and hotels as well as from BHA and GTZ. Both parties are still very enthusiastic about pursuing this cooperation.

#### In Denpasar

During a meeting attended by local stakeholders and Denpasar government institutions, GTZ was invited to deliver a short presentation on the progress of tsunami early warning in Denpasar district. The event included the launch of the new leaflet on tsunami evacuation procedures for Sanur, and the symbolic handing over of a radio communication device.

#### With the Governor

On 16 December, the GTZ Bali Team and representatives from the provincial partner institutions had the opportunity to discuss the latest developments in the project with the Governor of Bali, Made Mangku, and to hand over a TSUNAMIKit Bag. The governor welcomed the envisaged continuation of the cooperation for tsunami preparedness in the coming years.



Final workshop in Pilot Area Bali

### Final Workshop in PA Bali

The final workshop in PA Bali was officially opened by Assistant to the Governor of Bali Province. During the workshop the project achievements were revisited by the local working groups and shared with representatives from districts and provinces of East and West Nusa Tenggara.

The final workshop in Pilot Area Bali was held on 26 - 28 October 2010. The first day was an internal meeting with local partners. The second and third days were dedicated to sharing experiences with participants from neighbouring districts and provinces, and included a visit to the Emergency Operation Centre in Denpasar.

The “**Meeting with Local Partners**” brought together working group members from Badung District, Denpasar and the province level as well as political representatives (Mayor, Secretary) as special guests.

The working groups revised the results from a prior evaluation meeting and discussed the achievements and challenges in their respective areas. Later, agreements were made about how to move forward in the future.

The “**Workshop for Sharing Experiences**” conducted on the second day involved all participants from the internal meeting as well as representatives from local disaster management agencies (BPBD) of neighbouring districts and provinces, and representatives of national institutions, the local media and other institutions regarded as multipliers in the respective areas. The workshop started with an update on the latest developments in InaTEWS, including information about the new warning service guideline. Local partners then shared and discussed experiences from the pilot districts with the guests from East and West Nusa Tenggara . The project team gave an introduction to the concept and content of the TSUNAMIKit and handed copies over to local partners and representatives from the invited districts and provinces.

During the discussion the participants pointed out that:

- participants should report back on the workshop and initiate activities to overcome local shortcomings in order to prevent casualties in the event of a tsunami.
- It is necessary to build up local people’s awareness of the tsunami hazard and the importance of setting up tsunami early warning
- It is necessary to allocate local resources and to reach a commitment to improving community awareness of tsunami risk.

- There are shortcomings in human resources in East and West Nusa Tenggara, especially regarding knowledge of earthquakes and tsunamis, though there are some experiences as a result of the tsunami in Flores in 1992.
- There is a lack of local financial resources to establish disaster management and a lack of capacity on the part of local governments to meet the needs of the areas at risk.
- Not all regencies in East and West Nusa Tenggara have established BPBD in accordance with Government Regulation 24/2007.

On the third day, the external participants had the opportunity to visit the Bali Province EOC to learn how early warning procedures had been implemented in Bali. The visit was followed by an exchange of ideas for further cooperation and networking in tsunami early warning between the three provinces of Bali, West Nusa Tenggara and East Nusa Tenggara . The participants proposed:

- Establishing cooperation and networking for TEW, centred around Bali EOC and covering West and East Nusa Tenggara (inter-regional cooperation).
- To involve national institutions (BNPB, Ministry of Home Affairs, and BMKG) to take some responsibility on management of local disaster.
- That Bali Province EOC could provide services for tsunami early warning to East and West Nusa Tenggara. However, the decision on any action and information for the people living in the areas at risk need to be in the hand of local governments in East and West Nusa Tenggara.
- A high level political meeting among the three provinces (Bali, East Nusa Tenggara and West Nusa Tenggara) to discuss cooperation within the frame of a GITEWS follow up project
- Reporting back the results of the discussion to the respective political authorities (Governors / Mayors).



Tsunami drill at Padang 1 Senior Secondary School / Emergency Response SOP Workshop / TEWS Coordination Meeting in West Sumatera

## Padang

Recent disasters in Indonesia - including the Mentawai tsunami - provided lots of lessons learnt on how to improve local disaster management and preparedness. The earthquake and tsunami off the coast of West Sumatra generated discussion of the need for closer coordination and linking between the coastal districts, the city and the province for early warning. Even before the tsunami, the actors in Padang had been working on shelter management, finalising the first official vertical evacuation shelter building: the Padang 1 Public High School in the city of Padang. The emergency response SOP are being revised based on the outputs of discussion of the new disaster management platform - an important step towards comprehensive contingency planning.

### Testing the vertical evacuation shelter building

The date for the tsunami drill, including the testing of Padang 1 Public High School for vertical evacuation, prior to the Mentawai tsunami. On the morning of October 26, only hours after the Mentawai tsunami, a tsunami drill was conducted in Lolong Belanti village to test procedures and inaugurate the first vertical evacuation shelter building in Padang.

The drill started with the simulation of a large earthquake felt by people in Padang (indicated symbolically by a wail broadcasted via RABAB to loudspeakers at Padang 1 Public High School and mosques in the drill area. On hearing this sound, (feeling the earthquake), people evacuated immediately to the newly-built evacuation shelter building.

Before the drill, local community facilitators conducted outreach activities in the community of Lolong Belanti village, helped to develop their evacuation plan, and assisted the development of the evacuation procedures for Padang 1 Senior Secondary School. GTZ IS-GITEWS contributed to preparedness in Lolong Belanti village by providing evacuation route signage.



Padang 1 Public High School is the first school to be used as a vertical evacuation building in Padang.

Others are in the process of being developed. As many schools were damaged in last year's earthquake, the city government is evacuation taking into account in the rehabilitation of 100 schools.

### Revising the Disaster Emergency Response SOP

The Padang Local Disaster Management Agency (BPBD) initiated a three-day workshop (8-10 December) with local actors (government, NGOs, military, and police) to revise the disaster emergency response SOPs first developed in cooperation with local actors in 2006.

The workshop output is a concept for emergency response SOPs that adopts a multi-hazard approach, based on discussion of the new disaster management framework.

For the earthquake and tsunami hazard, the emergency response SOPs are linked to the official tsunami early warning SOPs for Padang,



After the workshop, a series of follow up activities are scheduled to take the concept of SOPs to a draft document for public consultation, and ultimately to simulation and to legalization.

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### Linking Tsunami Prone Areas in West Sumatera to InaTEWS

There are seven districts in the province of West Sumatera that are prone to tsunamis.

The West Sumatra BPBD of initiated a coordination meeting with the BPBD of each of the tsunami prone districts to define how tsunami early warning services can be provided in each district.

As one of the GITEWS pilot areas, Padang city has SOPs, equipment, and an institution operating 24/7 in place. Other districts (Padang Pariaman and Pesisir Selatan) have just started to link with InaTEWS.



Some conclusions from the meeting:

- The tsunami early warning service should be operated by each district, which already has the capacity. Otherwise it will be handled by the province.
- The first 7 minutes after an earthquake fall into the responsibility of each district to provide tsunami early warning service to their community. Each district that cannot provide the service will be supported by the province 10 minutes after EQ.



Final Workshop Pilot Area Padang



### Final Workshop in Pilot Area Padang

As the pilot project is coming to its end in December 2010, we took some time to evaluate and to see what has been achieved, and what still needs to be improved and done. The objective of the final workshops was to share the experiences, conclusions, lessons and outputs from more than four years of developing tsunami early warning and preparedness with other tsunami prone areas along the west coast of Sumatra.

### Evaluating four years of partnership and implementation

The objective of the evaluation was to look back on four years of developing the tsunami early warning system and preparedness in Padang. A part of the preparation of the final workshop in the Pilot Area Padang, the evaluation was conducted with all local stakeholders on 7 October 2010, to identify achievements, and the challenges that still need to be addressed—especially with regard to the sustainability of tsunami preparedness and early warning at the community level. Just before the final workshop, on 19 October, the local partners and the GTZ IS-GITEWS team sat down together once again. The local stakeholders reached agreements on follow up activities and recommendations to be implemented in the near future. The follow up includes finalizing the 2nd version of the tsunami evacuation map for Padang incorporating all inundation data based on the Padang Consensus, as well as revising the local disaster management plan and making sure that operational requirements for early warning and support for further community preparedness are included in the government's development agenda. Also recommended were the continuation of the capacity building efforts from the project, because InaTEWS is not finished – locally or nationally, and the empowerment of local facilitators for preparedness activities in Padang.

### Sharing lessons learnt with other tsunami prone areas

As one of the GITEWS pilot areas, Padang shared the lessons learnt in implementing tsunami early warning and preparedness with the other tsunami prone areas along the west coast of Sumatra at the final workshop on 20 - 21 October 2010. The first day involved presentations and discussions by BPBD, KOGAMI, and the local community facilitators (trained within the GTZ IS-GITEWS training programme). The partners from national institutions (BMKG, BNPB, RISTEK, and Ministry of Home Affairs) also participated in the event and took the opportunity to provide an update on the development of InaTEWS and the division of responsibilities with regard to warning services and preparedness. It was concluded that there is still a need for dissemination of the disaster management law (UU 24/2007) to all disaster management actors at local level, to build awareness of the disaster management responsibilities of each institution, and also – most importantly – to establish local budget allocation for disaster preparedness. The stakeholders in Padang also concluded that local government needs to give a set a good example to their communities in terms of disaster preparedness, and that recognition from the executive and legislative bodies as well as political commitment are crucial to ensuring that preparedness activities are included in the city's development agenda. On the second day, participants went on field visits to: (1) KPB & SIBAT, to learn about preparedness in two communities of Padang City, (2) Pertiwi 1 Senior Secondary School, to observe school preparedness, (3) Padang 1 Senior Secondary School, for the inauguration of the first vertical evacuation building in Padang, and (4) the Padang EOC, to learn how Padang provides tsunami early warning services. After the field visits, the participants from the tsunami prone provinces and districts along the west coast of Sumatra again came together to share their views and make recommendations.

### After four years: conclusions and recommendations for tsunami early warning and preparedness along the Indian Ocean coast of Sumatra

As a result of the discussions during the final workshop and the field visits, the participants made the following conclusions and recommendations:

- All tsunami prone areas in Indonesia should be connected systematically to the InaTEWS;
- The system is not completed yet, and capacity building for preparedness is not instant; therefore there is a need to continue what has been started;
- There is a need for a forum or platform to accommodate coordination along the west coast of Sumatra (regional centre for disaster preparedness);
- Pilot area should act as initiator for the other prone areas to get connected with the system and to be prepared;
- The results and recommendations of the workshop should be presented at the local, national, and international levels, and to the legislature, as one of the bodies responsible for implementing TEW and preparedness.

To implement InaTEWS in all tsunami prone areas in Indonesia needs collaboration from all actors horizontally and vertically for sake of their people.

Thanks to all partners who had supported the development of InaTEWS in pilot area Padang. Though, the process is not finished yet and further contribution and involvement from the actors is needed to continue the process.

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The location of the earthquake / areal photos of Baleraksok Village on South Pagailand before and after 25 October / measurement of tsunami height (source: BNPB)

### The Mentawai tsunami and its lessons for InaTEWS

The “slow earthquake” on 25 October 2010 generated tsunami waves that arrived within a few minutes at the coast of the Mentawai Islands of North and South Pagai. The tsunami killed around 500 people and destroyed the houses and livelihoods of many who survived. Can InaTEWS help to save lives under such circumstances? What are the lessons of the Mentawai tsunami and its aftermath for the warning system and tsunami preparedness in general?

Less than five minutes after the magnitude 7.2 earthquake at 21:42 (local time) off the coast of West Sumatra on Monday, 25 October 2010, the National Agency for Meteorology, Climatology and Geophysics of Indonesia (BMKG) issued a warning of a potential tsunami, which was sent out via various standard communication channels to local authorities in the region and broadcasted on TV stations shortly after.

Only a few moments later (5 - 10 minutes after the quake), a first tsunami wave hit the coast of Southern and Northern Pagai, two small islands in the Mentawai chain less than 100 km away from epicentre of the earthquake. People had felt only a minor tremor, a slow swaying movement that lasted for up to three minutes. As the quake was much weaker than the 2007 Bengkulu or the 2009 Padang earthquakes, which had not caused a destructive tsunamis, many people did not expect one this time, and did not evacuate. Just before the tsunami struck, people heard a roaring sound: the noise of the approaching waves. People survived because they had reacted by fleeing

to nearby higher ground immediately after the tremor or when they heard the roaring sound of the breaking waves.

According to reports, the warning had reached authorities on Mentawai but could not be sent to coastal communities due to a lack of communication networks. Some sources indicate that people saw the warning on TV just moments before the first wave hit. However, many did not take the warning seriously due to the quake's low intensity – and perhaps because the warning did not provide clear guidance on what to do, but warned only of a “potential tsunami”.

Fifty minutes after the quake, at around 22:34 (local time), the tsunami warning was officially lifted by BMKG, which stated “the tsunami threat has ended”. While the tsunami had already struck the Mentawais, tide gauge measurements, indicated no further tsunami threat for mainland Sumatra.

(The content of this feature is based on the results of post tsunami assessments by GITEWS and JST-JICA as well as additional informal information received.)

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### Conclusions

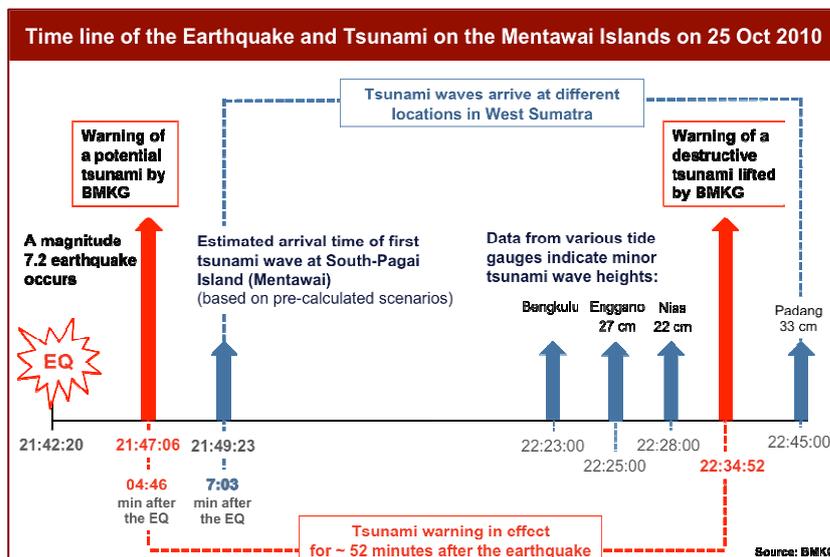
Tsunami early warning by InaTEWS cannot be considered a vital option for tsunami events with lead times of less than ten minutes. In the case of the Mentawai tsunami, the issue of the warning from BMKG almost coincided with the arrival of the first wave. Reaction to ground shaking and subsequent natural warning signs as well as proximity to higher ground determines whether people survive an event like the Mentawai tsunami.

### Lessons for InaTEWS

“Slow earthquakes” (with minor intensity but long duration) seem to be a rather frequent phenomenon in the tectonic setting of the Indonesian archipelago. The earthquakes that triggered the Banyuwangi Tsunami in 1994 and Pangadaran Tsunami in 2006 showed similar characteristics. The strategy of “evacuating only upon strong ground shaking” has to be reviewed. This implies a review of community awareness and preparedness programmes and material.

The warning product and content of InaTEWS as issued by BMKG requires further development in order to provide more instructive information to the public (via TV) that leaves no room for doubt.

Learning from the media response to the Mentawai Tsunami, public education and clear information to media stations and journalists has to be provided to avoid misinformation and misunderstanding that will ultimately undo the benefits of InaTEWS.



## Sampai Jumpa Lagi!

The GITEWS project "Capacity Building in Local Communities" has now come to its end. Although a lot has been achieved, the "job isn't done yet". Capacity building for tsunami early warning requires a longer effort. Germany will continue to support Indonesia in the next years to run and improve the system as well as to develop the capacities needed in the upstream and downstream part.

On this occasion, the team would like to thank all, who have involved in the project or accompanied us during the past years. A follow up project is expected to start by April 2011 and therefore, instead of saying good-bye, we'd better say: until we meet again!

*Until we meet again & all the best wishes for*

**A HAPPY NEW YEAR 2011**



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