

Capacity Building and Institutional Development in Local Communities A GTZ-supported project – part of the German-Indonesian Cooperation for a Tsunami Early Warning System (GITEWS)

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ABSTRACT: GITEWS (German-Indonesian Cooperation for a Tsunami Early Warning System) is financed by the German Federal Ministry of Education and Research (BMBF), and supports the development and implementation of an end-to-end Indonesian Tsunami Early Warning System (InaTEWS) in partnership with Indonesian Ministries (BMKG, RISTEK), various national institutions and local governments. The system uses a network of seismological stations, marine measurement units providing earthquake monitoring, ocean observation, and data processing. The warning concept – developed under the guidance of the German Research Centre for Geosciences (GFZ) and in close cooperation with national and international partners – will significantly reduce warning time and increase reliability. However, the technical achievements will not have the intended impact without a clearly defined and functioning warning chain (from national to local level), community preparedness, SOPs, and dissemination technology at local level. Community awareness of the hazard and an understanding of the warning system is key to its success. The pilot project ‘Capacity Building in Local Communities’ aims to develop appropriate mechanisms and tools for tsunami preparedness in tsunami-prone communities on the basis of three pilot areas. It is implemented by the German Technical Cooperation (GTZ-GITEWS) together with its Indonesian partners at local and national level. At national level capacity building is additionally supported by the Federal Institute for Geosciences and Natural Resources (BGR), InWent-Capacity Building International (Germany) and the United Nations University (UNU-EHS). In the three pilot areas of Padang, Java and Bali, local authorities have gradually begun to integrate tsunami early warning and preparedness into local regulations and institutions. The major challenges are related to the short warning times, getting the message to the people in time, managing uncertainty, enabling local authorities to fulfill their role in InaTEWS and building people’s awareness of how the system can help save their lives. The project’s experience shows that building capacities and developing tsunami preparedness strategies takes time. It requires external input, local ownership and political commitment. Exchange and dialogue between the stakeholders of InaTEWS is an important step towards a consistent end-to-end system. Public education on the hazard and the warning system is key to its success. Tailor-made outreach and information material helps to address the particularities of the tsunami hazard and the system. Experiences with earthquakes and tsunami warnings and drills provide a momentum to accelerate tsunami preparedness.

Keywords: capacity building, tsunami early warning, tsunami preparedness, last mile, Indonesia

1. INTRODUCTION

The devastating tsunami that hit Indonesia and other Indian Ocean countries in 2004 led to the development of a tsunami early warning system for the Indian Ocean. UNESCO coordinates this initiative. Each country is responsible for establishing its own national warning system. Selected countries will be designated Regional Tsunami Warning Providers for the Indian Ocean region. The German Government supports the development of the Indonesian Tsunami Early Warning System (InaTEWS). Its Federal Ministry of Education and Research (BMBF) finances the GITEWS project as important input to InaTEWS. The warning concept – developed under the guidance of the German Research Centre for Geosciences (GFZ) and in close cooperation with national and international partners – will significantly reduce warning time and increase reliability. As well as providing the technology components for the monitoring, forecasting and warning service, GITEWS also supports capacity building at all levels. The Federal Institute for Geosciences and Natural Resources (BGR), Inwent - Capacity Building International (Germany) and the United Nations University (UNU-EHS) support capacity building at national level. At local level, the German Technical Cooperation (GTZ) implements the pilot project ‘Capacity Building in Local Communities’. It aims at developing appropriate mechanisms and tools for tsunami preparedness and early warning on the basis of three pilot locations. In the pilot areas, the partners are local government institutions and other stakeholders from civil society. Based on the project’s definition, the term ‘community’ includes local government, stakeholders from civil society as well as the population. (Rudloff, A. et al 2009)

2. CHALLENGES

Statistically, destructive tsunamis occur every two to three years along the coastline of Indonesia (Latief, 2000). Tsunamis pose a significant threat to people’s lives, to the livelihoods and local economies of coastal communities.

Coastal communities in Indonesia have to cope with the threat from near field tsunamis. Near field tsunamis are a rapid onset natural hazard. The very short travel times of these tsunamis from the source – a nearby epicenter – to the shore generally limit warning and evacuation time to 20-40 minutes after an earthquake. Specific local tectonic, seismic and bathymetric

conditions may make warning and evacuation times even shorter in some areas. The National Tsunami Warning Centre (NTWC) of Indonesia uses seismic real-time data and predetermined flooding scenarios in coastal regions that are processed by a decision support system to issue a first warning of a tsunami threat within five minutes of an earthquake. Subsequently, data from sea level monitoring (with buoys and tide gauges) and land monitoring (with GPS technology) provide updates on the occurrence of tsunami waves and the estimated extent of the threat. This means that over time the situation becomes clearer and the NTWC provides updated warnings. However, due to the limited time for evacuation, officers of the NTWC as well as local authorities are confronted with a considerable degree of uncertainty when they need to decide whether to send out a warning and to call for evacuation.

Quick response to the earthquake by local authorities and people along the coast is a key to saving lives. Within a very short time clear warnings and instructive guidance need to be disseminated to the public, local authorities and interface institutions. Warnings have to reach people in urban agglomerations as well as remote and isolated rural areas along thousands of kilometers of Indonesian coast.

Indonesian decentralization policy puts local authorities in a challenging position in the end-to-end warning system. While the NTWC disseminates warnings and advice to local authorities, via the media and to other interface institutions, the mandate for an official call for evacuation that reinforces consistent community response lies within the responsibility of local authorities. To fulfill their responsibility local governments have to establish 24/7 operations, assign clear institutional mandates for early warning, and develop standard operating procedures (SOPs) for warning reception, decision-making and dissemination. The short wave arrival times and the limited time for evacuation do not permit the use of the usual command chain that involves the head of local government approving an official call for evacuation. Based on agreed and approved SOPs, local emergency operations centers need to be granted the authority to make an evacuation decision and to directly issue public guidance without prior approval from high-level officials of local government. This delegation of authority is still very much debated amongst local and national stakeholders of InaTEWS. The limited knowledge of the particularities of the hazard and the functionality of the warning system as well as a lack of dialogue between national and local level often hinders a purposeful discussion. At the same time, local authorities have difficulties in strengthening the capacity of their disaster management institutions and enabling them to take over responsibility in early warning. Ultimately, the challenge of managing uncertainty and the consideration of the consequences of a likely “false” alarm and “unnecessary” evacuation often leads to reluctance on the part of local government and emergency centers to deal with the issue.

Besides clear mandates, solid institutional capacities and procedures, tsunami prone communities require a local dissemination and public alert system that performs under the conditions caused by a strong earthquake. A tailor-made system has to deal with power failure and the breakdown of the usual communication networks. Experience, for instance from the earthquake in Padang (West Sumatra, on 30 September 2009), shows that a strong tremor causes immediate panic and chaos when people start evacuating. Getting immediate, clear and instructive information and guidance to as many people as possible via various communication channels under these circumstances is a key challenge of the last mile. The success of local dissemination systems, however, does not depend only on technical solutions. Local preparedness activities need to make sure that the public gets informed about how they can receive warnings and what to do in case of emergency. However, unreliable local dissemination solutions can impede confident public promotion of the local alert system.

A major challenge for InaTEWS still lies in the lack of public understanding of the warning system as a whole, local warning arrangements and how InaTEWS can help to save people’s lives. This refers to a lack of knowledge not only about the role of the NTWC and the responsibility of local authorities but also about the technical functionality of the system. Media reports that followed the earthquakes near Tasikmalaya (West Java, on 2 September 2009) and Sinabang (Aceh, on 7 April 2010) that were followed by tsunami warnings (but no tsunami) revealed this lack of public understanding. Often the ‘system’ is seen as a network of technical devices rather than a system that in fact depends greatly on human capacities and skills, systematic local preparedness planning, agreed procedures, decision-making capacity, and a common understanding of what to do and how to react. On 7 April, based on analysis of the media reports, many people referred to the warning as an *‘isu tsunami’* (Indonesian phrase for ‘rumor of a tsunami’) rather than official information on a tsunami threat. This underlines the challenges of translating warnings into clear public guidance by local authorities on the one side, and the need for public education on how the system works on the other. Only few media reports addressed this challenge and the functionality of the system in a clear and comprehensive manner. Ultimately, the performance of the end-to-end warning system will be measured by the ability to translate warnings into protective action by the people at risk and by their local authorities. This will only work if the end-users of the system – the people at risk – understand warnings and guidance and know what to do. Raising community awareness, communicating the benefit of the system and how it can save lives, and building trust in the system are still major challenges.

To enable local governments to establish the requirements for the end-to-end system and to provide their communities a clear picture of how it works, they require sufficient information and guidance from the national level. To date, there is still a lack of clear and official guidelines on the particularities of tsunami early warning and a dialogue between all levels that would help local authorities to set up the system. This is related to a lack of priority setting with regards to disaster preparedness at local level and to institutional constraints and unclear roles among national institutions that are involved in the further development of the last mile. This in turn is rooted in the ongoing shift in paradigm from one of emergency response to one of risk reduction and preparedness.

Tsunami early warning is primarily a public service provided by government. However, building an effective end-to-end system requires contribution from all stakeholders. Coordinating and building awareness, cooperation and trust among these stakeholders, who often have varying interests and perspectives, is a major challenge and requires strong leadership and commitment. Experience from the pilot areas shows that as soon as there is political buy-in and priority setting with regards to risk reduction, the preparedness planning process accelerates. In the absence of leadership by the government, civil society

actors (from NGOs or the private sector) play an important role in advocating for preparedness. (Thomalla et al 2009, Hoppe and Marhadiko 2010, Taubenböck et al 2009, Mileti and Sorensen 1990, Kunz-Plapp 2008)

3. CAPACITY BUILDING APPROACH

Building a consistent, end-to-end and people-centered early warning system like InaTEWS demands the contribution and coordination of a wide range of individuals and institutions at different levels. The development and implementation of an effective warning chain, a consistent warning scheme and understandable messages can be achieved only through the direct participation of those at risk. This is reason enough for the project to adopt a systemic view and opt for a multi level approach when defining the strategy for capacity building in local communities.

The main focus was set on the district level, as the responsibility to set up mechanisms for decision-making and warning dissemination to the community at risk lies with district governments. Activities at the national level related to the development of the warning chain concept and the implementation of the link between the NTWC and the local level. The project promotes dialogue and exchange of experiences between actors from all levels. The project uses a piloting approach (figure 1) that supports local partners in three pilot areas (figure 2) in their preparedness process and simultaneously gathers experiences on how best to implement tsunami early warning at the local level. The project shares these best practices with national institutions that have the mandate to guide other tsunami-prone regions in their preparedness process, with the objective of building a consistent end-to-end early warning system throughout Indonesia. (GTZ IS-GITEWS 2010)



Figure 1: Pilot Project Strategy

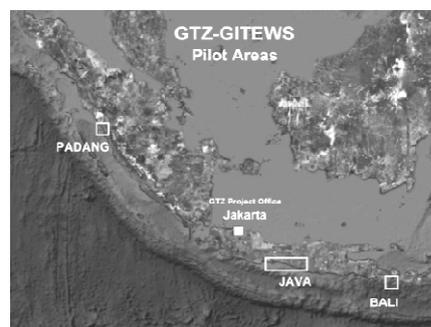


Figure 2: Map of GTZ-GITEWS pilot areas

Cooperation with other international partners, such as UNDP, IFRC, USAID and NOAA, and within the UNESCO-ICG Working Group on Community Preparedness is part of the project approach. The project concept is based on the UN-ISDR framework for early warning and focuses on “Preparedness” as defined in the framework of Disaster Risk Reduction.



Figure 3: Four elements of early warning

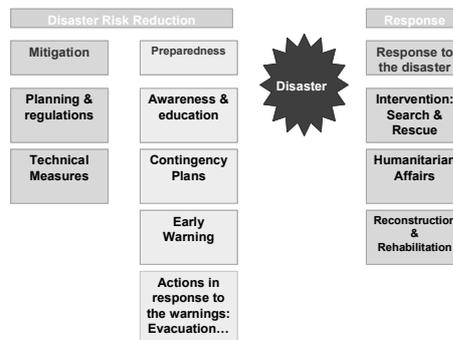


Figure 4: DRR framework

The capacity building approach in the pilot areas aims to support a local change process towards tsunami preparedness (figure 5). The support is provided in the form of a process-oriented, long-term cooperation.

To strengthen multi-sector coordination for preparedness, the local governments in the pilot areas were encouraged to appoint local multi-stakeholder working groups. Through workshops, trainings and exercises, these groups developed appropriate solutions for tsunami early warning and preparedness at local government and community levels. Subsequently, the partners were supported to institutionalize these achievements by developing local legal regulations and institutional arrangements, and providing community outreach materials and support of awareness campaigns at grassroots level.

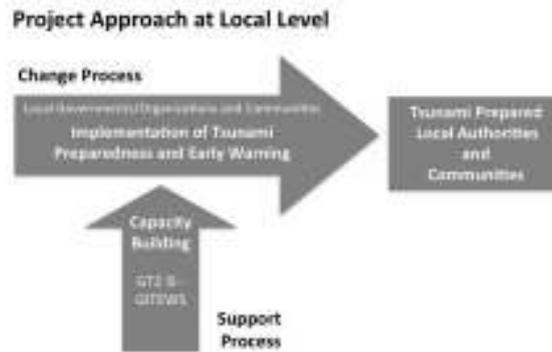


Figure 5: Project approach at local level

4. OUR EXPERIENCES

Building capacities and developing tsunami preparedness strategies takes time. Disaster preparedness and risk reduction is a new paradigm for most Indonesian institutions at national and local levels, the general public and for the communities at risk. In order to promote disaster risk reduction at all levels, Indonesian disaster management institutions need to assure long term capacity building. Understanding early warning for near field tsunamis requires considerable background knowledge. All actors involved need to be aware of the short warning times and the uncertainty involved to make an informed agreement on a simple and fast warning chain with few yet clear steps.

Building institutional capacities requires external input, local ownership and political commitment. Tsunami early warning was largely implemented in the pilot areas that were supported for more than three years by GTZ and other actors. There is a clear correlation between political will and acceleration of the preparedness planning process. Advocacy to decision makers is a key to obtain approval on key aspects of tsunami preparedness such as hazard maps and local warning procedures and mandates. A focus must be placed on the institutionalization of preparedness and early warning in terms of budget and planning as well as the integration of procedures and mandates into local regulations. Finally, implementation of procedures and maintenance of equipment requires skilled personnel who have undergone intensive training.

Exchange and dialogue between the stakeholders of InaTEWS is an important step towards a consistent end-to-end system. The development of national references and guidelines for InaTEWS requires the participation of stakeholders from all levels. An exchange program which facilitated dialogue between partners in the different pilot areas and between the local and national levels was very helpful in building trust and cooperation, and a common understanding of the system, and provided a platform for sharing experiences and getting updates on the warning system from national actors.

Public education on the hazard and the warning system is key to its success. People need to understand how the system works. Outreach campaigns have to be based on a clear understanding of the perspective of the people on the hazard and the warning system as well as their perspective of the government as the warning provider. Outreach cannot just give general messages but must explain the hazard, how the warning system is implemented locally, how people get information, and how they need to react in simple key messages.

Tailor-made outreach and information material helps to address the particularities of the tsunami hazard and the system. Outreach material for communities requires different language and content from the information material for local authorities. Complex matters have to be translated into simple messages. Visual aids are key.

Experiences with earthquakes and tsunami warnings and drills provide a momentum to accelerate tsunami preparedness. These kinds of events, whether real emergencies or tsunami simulation exercises, usually directly involve the public and the decision makers. They raise attention to the topic and are unique opportunities to put procedures into practice and experiment what works. Each drill or real event should be evaluated. The lessons can further push preparedness.

5. REFERENCES

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