



## **On the importance of risk knowledge for an end-to-end tsunami early warning system**

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Warning systems commonly use information provided by networks of sensors able to monitor and detect impending disasters, aggregate and condense these information to provide reliable information to a decision maker whether to warn or not, disseminates the warning message and provide this information to people at risk. Ultimate aim is to enable those in danger to make decisions (e.g. initiate protective actions for buildings) and to take action to save their lives. This involves very complex issues when considering all four elements of early warning systems (UNISDR-PPEW), namely (1) risk knowledge, (2) monitoring and warning service, (3) dissemination and communication, (4) response capability with the ultimate aim to gain as much time as possible to empower individuals and communities to act in an appropriate manner to reduce injury, loss of life, damage to property and the environment and loss of livelihoods. Commonly most warning systems feature strengths and main attention on the technical/structural dimension (monitoring & warning service, dissemination tools) with weaknesses and less attention on social/cultural dimension (e.g. human response capabilities, defined warning chain to and knowing what to do by the people). Also, the use of risk knowledge in early warning most often is treated in a theoretical manner (knowing that it is somehow important), yet less in an operational, practical sense. Risk assessments and risk maps help to motivate people, prioritise early warning system needs and guide preparations for response and disaster prevention activities. Beyond this risk knowledge can be seen as a tie between national level early warning and community level reaction schemes.

This presentation focuses on results, key findings and lessons-learned related to tsunami risk assessment in the context of early warning within the GITEWS (German-Indonesian Tsunami Early Warning) project. Here a novel methodology reflecting risk information needs in the early warning context has been worked out. The generated results contribute significantly in the fields of (1) warning decision and warning levels, (2) warning dissemination and warning message content, (3) early warning chain planning, (4) increasing response capabilities and protective systems, (5) emergency relief and (6) enhancing communities' awareness and preparedness towards tsunami threats. Additionally examples will be given on the potentials of an operational use of risk information in early warning systems as first experiences exist for the tsunami early warning center in Jakarta, Indonesia. Beside this the importance of linking national level early warning information with tsunami risk information available at the local level (e.g. linking warning message information on expected intensity with respective tsunami hazard zone maps at community level for effective evacuation) will be demonstrated through experiences gained in three pilot areas in Indonesia.

The presentation seeks to provide new insights on benefits using risk information in early warning and will provide further evidence that practical use of risk information is an important and indispensable component of end-to-end early warning.