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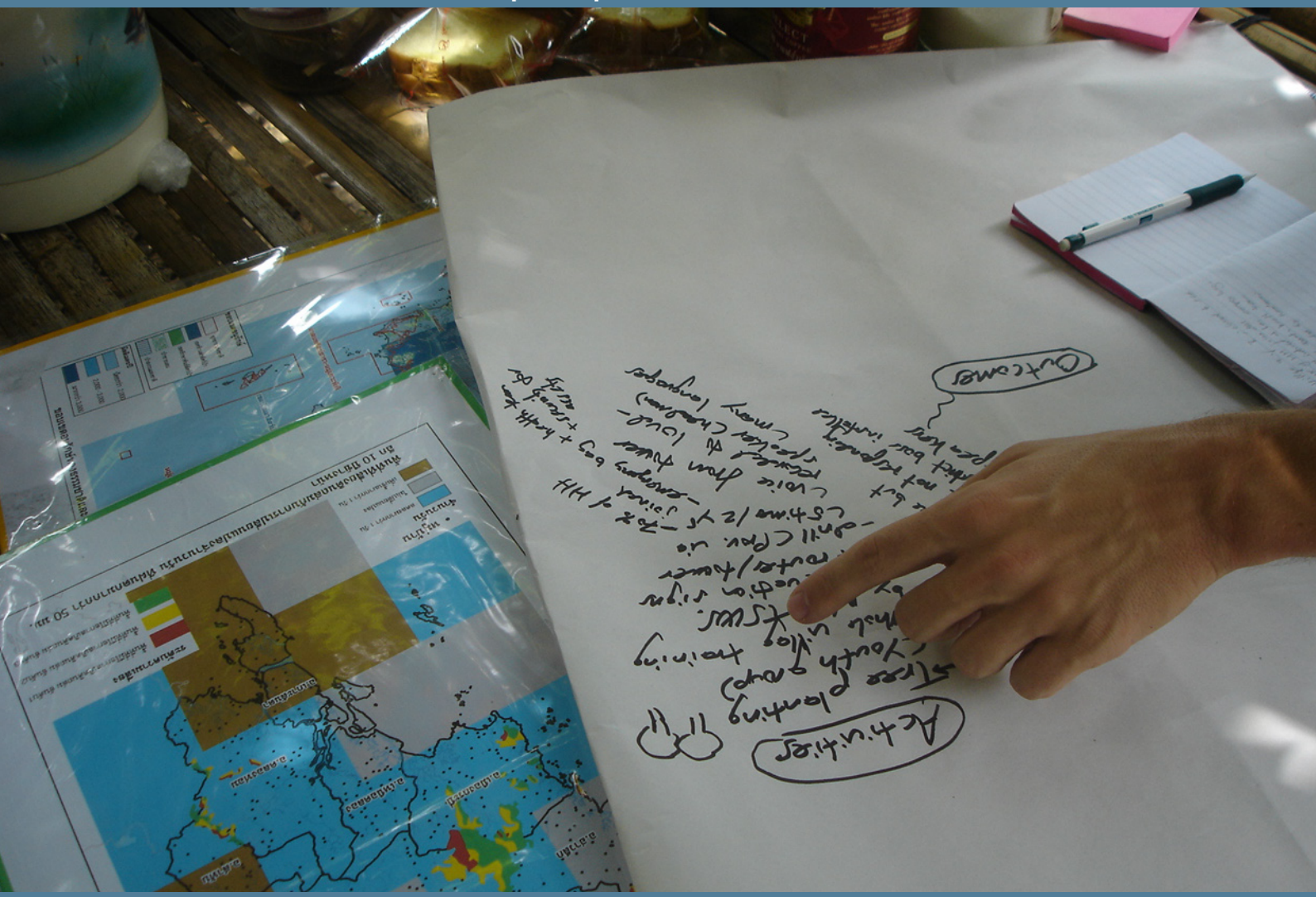

Linking Communities and Technology in the Indian Ocean Region

Summary of an Online Dialogue on Early Warning

Delia Paul, Rasmus Klocker Larsen, Frank Thomalla, Fareedali Kanji,
Atiq Kainan Ahmed and Bruce Ravesloot

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Summary of an Online Dialogue on Early Warning

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1 INTRODUCTION: WHY HOST AN ONLINE DIALOGUE?

The 2004 Indian Ocean tsunami was a cataclysmic event that changed our ways of thinking about disaster preparedness. Almost a quarter of a million lives were lost – many of them in locations made familiar to the rest of the world, through postcards and package holidays, as idyllic travel destinations.

Prior to the tsunami, there was already an extensive literature in existence about the importance of early warning systems, and a general consensus among governments and aid agencies that more should be done to enhance preparedness to coastal hazards. Yet the tsunami largely caught the region unprepared.

Following the massive aid effort to clean up and restore coastal areas in India, Sri Lanka, Thailand and Indonesia, the immediate focus was on the need for technologically-based warning systems. However, many disaster preparedness agencies also spoke of the need to link technologically-based warning systems to community structures so that warning messages would be heeded and acted upon effectively. Technical systems, the thinking went, could only be as good as the weakest link in the chain of information and organisation. Furthermore, many policy makers and practitioners at international and regional levels expressed the view that the mainstreaming of disaster risk reduction in national and local government policies – in particular, 'last mile' coverage – had yet to be implemented.

The meaning of 'last mile' coverage has been much discussed. In the communications discipline 'last mile' describes the final leg of delivering connectivity from a telecommunications or cable TV service to a customer, but its adoption by the disaster management community has somewhat muddied its meaning. In business usage 'last mile' coverage refers to a specific segment of a complete communication service, whereas in disaster preparedness it is broadly applied to all the social elements of Early Warning Systems. As such, the term 'last mile' has been criticised, with some justification, as representing a top-down approach. Some organisations use 'first mile' instead to emphasise their own community-based approach.

With these issues in mind, and supported by funds from the Swedish International Development Cooperation Agency (Sida), the Stockholm Environment Institute (SEI) in partnership with the Asian Disaster Preparedness Centre (ADPC) and the Raks Thai Foundation undertook a participatory assessment between July and December 2008 focussing on the three most severely tsunami-affected countries - Sri Lanka, Thailand and Indonesia. The exercise aimed to better understand the challenges and enabling conditions for different actors in strengthening the technology-community linkages of Early Warning Systems – often referred to as the 'last mile' in disaster preparedness. The three organisations consulted with government agencies involved in disaster management, coastal resource management and community development at various administrative levels, international and national non-governmental organisations (NGOs), community-based organisations and coastal communities. The researchers were guided by the idea of 'community resilience' as a framework for exploring how Early Warning Systems could be effective.

This exercise generated many interesting findings, largely through interviews and community focus groups. (These are summarised on pages 4 to 6). However the researchers wanted to take this stakeholder assessment a step further, presenting their findings back to interviewees and others, and enabling reflection within a wider forum on the insights generated. Such a process needed to take place across several countries and be open to as many disaster preparedness practitioners as possible. To achieve this, a web-based dialogue was organised to:

- Share preliminary insights from the stakeholder assessment with those who had participated, and from any other individuals interested in contributing their own insights; and

- Reflect collectively on the insights and their implications for building an improved understanding of existing challenges in implementing policy and guidance for Early Warning Systems development, particularly in the 'last mile'.

The online dialogue ran for six weeks from May to June 2009, and was moderated by facilitators from four organisations: SEI, ADPC, the Raks Thai Foundation and Macquarie University, Sydney.

2 DIALOGUE TOPICS

The dialogue was grouped into four general discussion areas corresponding to the four elements of people-centred early warning systems – a framework widely used by United Nations agencies and NGOs.

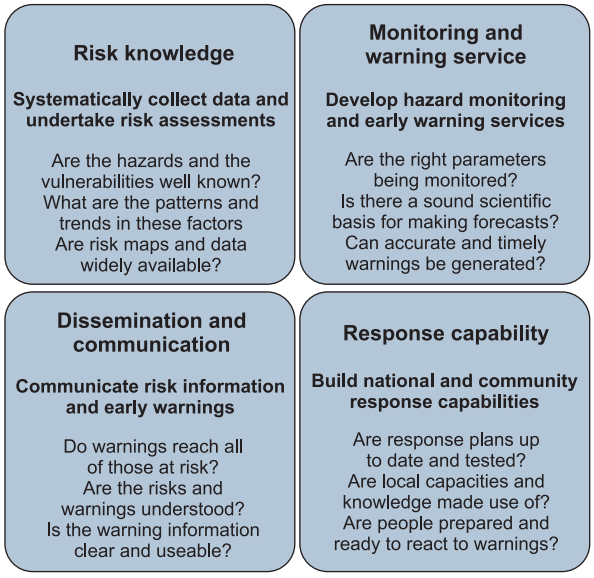


Figure 1: The four elements of people-centred early warning systems (Source: UN/ISDR PPEW, 2009)

The discussion questions for the online dialogue were formulated based on the prior findings of the stakeholder assessment carried out six months before. This assessment had generated a number of findings (see Thomalla et al, 2008, and Thomalla et al, 2009 for details). In summary, the findings of the stakeholder assessment prior to the dialogue found that:

1 There is a lack of resources at sub-national government levels

Despite the large influx of international funds for the development of Early Warning Systems for the Indian Ocean, there is a lack of capacity for disaster risk management activities at the lower levels of government. As a result, provincial, district and municipal governments lack the staff and financial capacity to manage the considerable tasks of disaster risk management assigned to them by their national governments. Hence, progress in preparing disaster risk management and emergency plans varies substantially between countries, and even between provinces, districts and municipalities within the same country.

2 Community-based disaster risk management relies on volunteerism

As a consequence of the lack of resources, community-based disaster risk management relies heavily on volunteerism. Incentives for young volunteers include, for example, training in health care, language and other skills beneficial for future employment, career advancement, and improved social status. Despite these incentives and the volunteers' dedication, there are concerns about the longer-term sustainability of any disaster preparedness efforts that rely to such a large extent on volunteerism, because even volunteers require basic financial support for operational logistics. The lack of funds to compensate volunteers for their time is a cause of low staff retention. The high turnover of volunteers and the need for the continuous recruitment and training of new staff can put a considerable strain on an organisation. The lack of resources also causes frustration amongst volunteers about their inability to act and induce positive change in their communities.

3 Sub-national disaster risk management is fragmented and sectoral

Since the 2004 tsunami, national-level disaster preparedness planning has been considerably improved through new policy frameworks and a restructuring of the roles and responsibilities of different government agencies for disaster risk management and early warning. However, the integration of community-based disaster risk management in sectoral policies and the establishment of Standard Operating Procedures remains a challenge. Poor planning and coordination is manifest in autonomous actions by various organisations and government departments in disaster preparedness, resettlement, livelihood support and reconstruction. The links between coastal zone management, natural resource management and disaster risk management are not well understood, and few integrated approaches addressing these links exist. While many opportunities for disaster risk management in the environmental domain go unrealised, some efforts are being made to integrate its management into development planning processes and so reduce disaster risks in the recovery process and improve livelihoods.

4 Community-based disaster risk management is motivated by many needs and interests

Local actors such as NGOs, community-based organisations and sub-national government agencies have many and often diverging motivations for engaging in community-based disaster risk management. These

include a concern over the risks, a lack of trust in national Early Warning Systems, and an interest in the co-benefits for natural resource management and livelihoods improvement. In order to improve coordination between the different actors, these multiple needs and interests relating to the 'last mile' must be addressed. The degree of implementation of disaster risk management and Early Warning Systems policies and strategies depends to a large extent on the willingness and priorities of local administrators, and the way in which proposed interventions are framed to address local priorities and build partnerships.

5 Competition between governments and NGOs

Disaster risk management is often marked by intense competition and rivalry between government agencies and NGOs. Also, NGOs and community-based organisations tend to have limited legal status and because of this are often ignored by government authorities in national and sub-national agenda-setting and decision-making processes. Government representatives consider NGOs to be 'over-participatory', focussing too strongly on community engagement and not seeking closer collaboration with government agencies. These views reflect a polarisation between a top-down government approach to provide early warning technology and Standard Operating Procedures, versus a bottom-up NGO approach that focuses on community-based disaster preparedness. Nonetheless, in many cases NGOs and governments approach community-based disaster risk management primarily as an issue of awareness raising and knowledge transfer rather than the building of collaborative programmes for knowledge sharing.

6 Policies are ambiguous and international guidance too generic

Policies are widely criticised for the absence of implementation guidelines. Guidance and recommendations for the implementation of disaster risk management policies are frequently generic or ambiguous, and not directly applicable to local contexts, let alone targeted at field staff. Local government agencies frequently lack the human and technical capacity to implement policies and guidelines in the context of their daily work because sufficient information and resources are not available at this level. Policies need to be 'fine-tuned' taking into account the local context, traditions, culture and indigenous knowledge; this remains a challenging process involving many stakeholders. For these reasons, some agencies and organisations have developed their own manuals based on lessons learned from their own projects and operations.

Given these findings, a series of questions was developed to initiate discussion in the online dialogue. Each of the discussion areas included a series of questions that were rolled out over a period of six weeks. The general discussion areas are shown in the figure below, followed by a list of the discussion questions posed by the facilitators.

Risk Knowledge	Monitoring & Warning Service	Dissemination & Communication	Response Capability
Emphasis on technology Multi-hazard perspective	Problems with technical components of the Early Warning Systems International guidance, Policies and Standard Operating Procedures	Trust in the ability of the Government to provide Early Warning Systems Dissemination of early warnings Understanding of end-user needs Competition between Government and NGOs	Capacity to undertake Disaster Risk Management at the local level Community-based disaster risk management is motivated by many needs and interests Reliance on volunteerism Disaster preparedness and risk perception
General for all the components: Funding and long-term sustainability of Early Warning Systems Comments in general or other relevant issues			

Figure 2: Discussion topics grouped by the four elements of people-centred early warning systems

Risk knowledge

- Is too much emphasis placed on the technology of Early Warning Systems?
- Technology versus Community – where does the emphasis lie?
- 'First mile' versus 'Last mile' – how should we think about technology-community linkages?
- Are we lacking a multi-hazard perspective?

Monitoring and warning services

- How can problems with the technical components of Early Warning Systems be overcome?
- What are the prospects for funding and the long-term sustainability of early warning activities?
- What kind of guidance would improve policies and Standard Operating Procedures?

Dissemination and communication

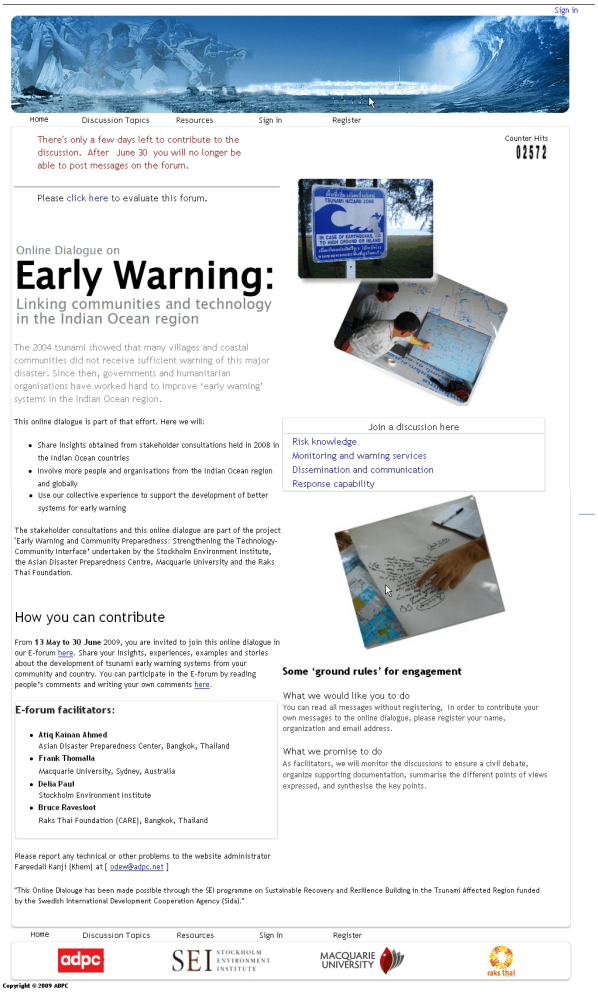
- How can people's lack of trust in early warnings be addressed?
- What are the best ways to disseminate early warnings?
- How useful are standard methods and tools for improving community preparedness?
- Are government agencies and NGOs adopting opposite, polarised approaches?

Response Capability

- Is there a lack of human resources, knowledge, experience and skills relating to disaster risk management at the sub-national level?
- Is there a lack of political will to engage in disaster risk management?
- Is more guidance from the national government needed?

3 REPRESENTATION AND PARTICIPATION

Participants from at least 118 different organisations registered to take part in the online dialogue and by the end a total of 155 people had registered.



More than half of those registered were from countries affected by the 2004 Indian Ocean tsunami. Almost three-quarters came from Southeast and South Asia. The remainder were from many other countries, including Ethiopia, Nigeria, Madagascar, Tajikistan, Iceland and American Samoa, suggesting there is strong interest in early warning as a solution to multi-hazard risks beyond tsunami events.

Participants' input to the dialogue drew a rich picture of the complexities of the development and implementation of Early Warning Systems. Their comments and discussion points were integrated into the analysis of the evidence from the stakeholder consultations and were incorporated into the final

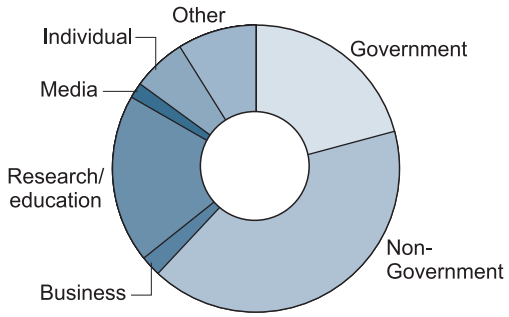


Figure 4: Participants by type of organisation

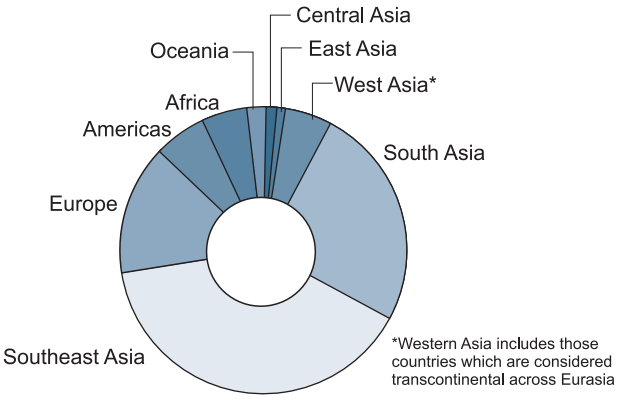


Figure 5: Participants by region

project report (Thomalla et al, 2009). In general, the online dialogue supported the insights from the stakeholder consultations, and in some cases substantiated these with further evidence. Overall, the dialogue provided an open, international platform where people were able to share their experiences and ideas in many-to-many conversations on early warning in the Indian Ocean region.

Email invitations to participate were sent to individuals, and to specialist disaster preparedness websites and mailing lists. The Asian Disaster Preparedness Centre forwarded an initial email invitation to their mailing group of around 4,000 names. The Stockholm Environment Institute followed up with an invitation to a list of 190 professional contacts, many of whom had indicated their interest in the topic during an earlier phase of the project. Invitations were also posted on websites including PreventionWeb, CabNet, the United Nations International Strategy for Disaster Reduction

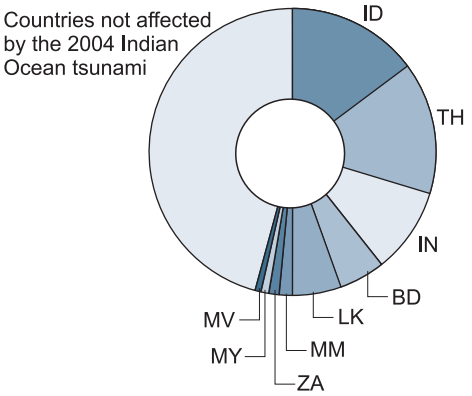


Figure 6: Participants by from countries affected by the 2004 Indian Ocean tsunami

(UN/ISDR) and RedR. Only electronic communications were used to contact participants.

The key points shared by the participants are documented in the following section, and organised according to the main emerging themes. Several participants shared links to key documents, case studies, networks, databases and websites relevant to the discussion (see Appendix 1). Comments were wide-ranging; the dialogue conveyed insights into both the breadth of the issues and the diversity of opinion on many topics. In many cases there was no agreed conclusion; the bullet points simply indicate the range of responses in the dialogue.

4 CONTENT OF RESPONSES

RISK KNOWLEDGE

Is too much emphasis placed on the technology of Early Warning Systems?

- Risk knowledge is essential in mitigating and reducing risk, in particular, in addressing the vulnerability of high-risk communities.
- Risk knowledge should be addressed at the level of each of the sub-systems in the early warning chain, and should be specific to the context and target audiences.
- There can be two categories of risk knowledge: stationary knowledge of risk, i.e. spatial knowledge, and a more dynamic knowledge of risk reflecting real-time occurrences.
- It is important to distinguish between and acknowledge the various underlying causes of vulnerability, such as prevailing social and gender inequities, and poverty and marginalisation.
- The nexus between gender, poverty and the caste system in India creates significant barriers to accessing risk knowledge and participating in early warning processes.
- It is the responsibility of governments to address issues of inclusion and social empowerment in matters of participation, ownership and decision making while initiating early warning systems.
- The impacts of disasters on men and women differ greatly. Gender plays an important role in determining participation in disaster risk reduction as well as response processes.
- Traditional roles assigned to women limit their ability to have their concerns and needs included; their realities are often not embedded in local risk knowledge.
- Risk must be monitored from a community's perspective to ensure local ownership over early warning processes.
- People at risk need to receive clear, simple, relevant and timely warnings that are easy to understand. Failure to provide these can undermine the whole Early Warning System.

Technology versus Community – where should the emphasis lie?

- There is too much emphasis on technology, with technology coming first and people later. This is clearly demonstrated by the fact that most early warning literature deals with only sensor and detection or monitoring elements.
- Technology is not always reliable in predicting either natural disasters or extreme weather conditions.
- It is commonly assumed that new technology is an inevitable part of an early warning system, but this is not necessarily true. Communities often adopt their own channels for receiving alerts, including those from neighbouring communities.
- Lack of acceptance of technology is due to misconceptions and lack of knowledge on the part of the community. Information gathered through technological means must be interpreted correctly and be specific as to the context.
- Technical terms should be adapted so as to be a part of risk education appropriate for the community. An example from Sri Lanka was given, where in 2007 the local media issued a 'tsunami watch' over CB radio, but community people had no idea what this meant.
- When reaching out with risk knowledge to communities, it is also important to understand the constraints of certain types of technology. Content standards differ according to the technology used, for example, although a mobile phone has a limited message capacity, it can divert the subscriber to a more comprehensive resource such as a website or radio station.
- A people-centred approach may close the gap between a technocratic approach to risk knowledge versus a community approach. This should take into account the fact that early warning systems must be specific as to their context and audience, and must take into consideration the type of hazard, the technology used, and the social aspects of that situation.
- Evidence suggests that an adequate job can be done with warning systems through existing

communication technologies - radio, television and mobile phones - without the need to invent new technology.

- Trust in familiar technologies seems greater than trust in high-tech sensor, detection and decision sub-systems, and this is partly due to many false warnings in the past.

- It is not cost-effective to invent, adapt or apply new technologies to fit the response system's 'first mile' needs. One possible solution might be to retrofit 'last-mile' communication technologies that are available on the local market, and then use a combined top-down/bottom-up approach to fine-tune the technology.

- Risk knowledge available to experts in the form of real-event data and simulations needs to be communicated to 'at risk' communities in ways that are meaningful to them, with information they can act upon.

'First mile' versus 'last mile' – how should we think about technology-community linkages?

- The discourse which states that warning systems need to go the 'last mile' to reach users reverses the way in which warning systems should be designed.

- Warning systems should be designed and implemented with the 'first mile' – starting with the users and letting them explain what they need and expect from the system.

- There is an apparent misconception of the terms 'last mile' and 'first mile'. The term 'last mile' comes from the communications discipline, where it is well defined. What has happened is that the disaster management community has associated the term with the social element of the Early Warning System, that is, where it reaches the people. When one is referring to the communication technology of early warning, then it is correct to use the term 'last mile' in referring to a communication segment.

- However, if one is talking about the social element, then the term 'first mile' would be more appropriate to describe a people-centred approach to early warning to refer to meaningful involvement in all stages of the early warning system.

- Political will to change policies and institutional behaviour, and the public's trust in government, are key issues in strengthening Early Warning Systems.

- The term 'national disaster' is more appropriate than 'natural disaster', as nature too often takes the blame when the disaster is actually caused by ineffective national early warning and response systems.

- Governments may invest in expensive technological Early Warning System solutions based on opportunities for private gain through corrupt means.

- Technology – in whatever form – does play an important role in Early Warning Systems, but national authorities often do not have the capacity to operate and maintain these. Investments in Early Warning Systems infrastructure are often not matched with the necessary investments in staffing and maintenance.

Are we lacking a multi-hazard perspective?

- The root cause of disasters is vulnerability. Hence, any multi-hazard Early Warning System must address the multiple aspects of vulnerability. These multiple aspects are usually neglected, sidelined or bypassed in favour of approaches that focus on hazard and deal only superficially with vulnerabilities.

- The significant Early Warning System investments made in recent years are single-purpose and do not properly address multi-hazards as is often claimed. For example, the warning towers erected in many countries are purely for tsunami warnings. Such investments may not even be cost-effective, as cell broadcasting is many times cheaper than erecting siren towers.

MONITORING AND WARNING SERVICES

How can problems with the technical components of Early Warning Systems be overcome?

- Drills are important in improving warning services. Exercises should be tailored to particular sectors, such as health, in order to take actions that are specific to that sector.

- Drills are useful in identifying and correcting problems such as failures of the sirens to sound,

roads to the shelters being too small, and traffic congestion.

- In some cases such challenges still exist despite extensive training and careful planning. One could also look at drills as an exercise for different actors to apply the knowledge and procedures they have learned in preparedness training and planning, and to reflect on the outcomes of the planning to date. In that sense, drills can be seen as an indicator of the successes and shortcomings of such efforts.

- In terms of risk knowledge, it is important to have good hazard information that supports disaster preparedness planning. Information about weather conditions and hazards, such as floods, serve as the basis for developing disaster preparedness plans, land-use plans and school curricula. However, in many localities these kinds of data are either insufficient or entirely lacking.

What are the prospects for funding and long-term sustainability of early warning activities?

- Natural hazards are a serious barrier to achieving the Millennium Development Goals and it is therefore important to integrate disaster risk reduction, poverty reduction and sustainable development efforts.

- After the 2004 tsunami, a large number of organisations developed their own alert systems without ensuring compatibility, integration and adherence to government standards and regulations. As a result, disaster management authorities are now faced with the problem of having to document, test and integrate these different systems.

- The appropriateness of different technology should be determined by the local disaster management boards, and financial resources should be provided to enable the boards to undertake these tasks.

- Before a new system is built, it needs to be clear who will test and maintain it, who will conduct training and drills, and how it will be integrated into the national network of alerting systems.

- In order to ensure that existing alert systems become more integrated and sustainable in the future, all systems already in place need to be mapped to identify where additional programmes are needed. Decisions also need to be made as to which data will be shared and how.

- The sustainability of a system depends on many factors such as the existence of red tape, local regulations, the availability of financial and human resources, and the operational costs. Therefore no single solution fits all situations. It is important to support creative approaches, rather than adhering to conventional thinking.

- Micro-finance schemes are public-private partnerships, and are good tools in disaster risk reduction. However, microfinance schemes and public participation efforts frequently fail because of vested interests and a lack of transparency.

- One company, as part of a Corporate Social Responsibility programme, provides free air time access to government stakeholders to enable them to issue local and national alerts through the entire media network.

- There is an example in the Philippines where early warnings are disseminated by a private source to complement the efforts of the national bureau.

- The Naga College Foundation Typhoon Preparedness Centre in the Philippines is acknowledged by the local government as a legitimate source of information. It provides detailed real-time weather and flood height warnings for local areas. The information is provided at one- to three-hourly intervals during typhoons through local radio stations, text messaging services and the internet. The media provide information from these sources.

- The content of early warnings should not be too technical if they are to be easily understood by communities, and warnings should reach communities early enough so that they have sufficient time to prepare.

- One study of two communities along the Mekong River indicates that villagers receive flood warnings through a number of different sources including television, radio, information boards, local authorities and neighbours, depending on their resources and the efforts they put into obtaining information.

- The most common sources of information are often next-door neighbours and the media. Village people often have good knowledge of the timing of regular floods, but rely on the media to warn them of flash floods.

What kind of guidance would improve policies and Standard Operating Procedures?

- Members of one Provincial Disaster Coordinating Council plan to develop standard protocols for early warning based on a classification of hazard types.

- Coordination between the activities of provincial government authorities and civil society organisations could be improved through the establishment of a Technical Working Group. Such a group would then provide a forum in which all actors share resources and expertise, and jointly identify the needs and capacities of the communities in the province.

- How to balance a 'top-down' desire for standardisation with the demonstrated need to contextualise processes at the local level for end-users? This depends on the applicability and transferability of Common Alerting Protocols developed for the USA across many different contexts and situations.

DISSEMINATION AND COMMUNICATION

How can people's lack of trust in early warnings be addressed?

- Lack of trust is an issue when establishing early warning systems. This is especially the case in settings where governments are perceived as being neither accountable nor transparent.

- There are many links in the 'trust chain' as messages are relayed from source to recipients. Therefore to be effective, early warning systems rely not only on their internal structures but also on the surrounding governance context. Effective messages are coherent with their cultural setting.

- Further community awareness raising is needed to understand and respond appropriately to the differences between alerts, warnings and evacuation messages.

What are the best ways to disseminate early warnings?

- More should be done to improve technological capacities in countries for improved Early Warning Systems. In Thailand, for example, there is too much reliance on mobile telephony, which may fail in certain emergencies. Deregulatory measures are needed to permit the use of walkie-talkies and ham radio by civilians.

- Attention should be focused on the ways in which communities self-organise and respond to warnings. Existing access to communications technology may already be sufficient; the challenges lie in the area of formulating appropriate messages and ensuring these are well understood.

- Local early warning networks could be linked to international warning centres, perhaps using satellite connections as the backbone of a larger system.

- Warnings should target only those communities affected. Wide coverage of warning messages creates unnecessary uncertainty.

How useful are standard methods and tools for improving community preparedness?

- Standard tools and approaches to community-based disaster preparedness need to be adapted to the specific local context.

- KOGAMI, a local organisation for disaster preparedness in Padang, East Java, has found that the standard questionnaires for the evaluation of community preparedness did not yield sufficient information, and so have adapted questionnaires to their local context.

- The five indicators in the Hyogo Framework for Action (level of knowledge, understanding of Early Warning Systems, evacuation planning, resource mobilisation and policy) are being used effectively.

- Target setting is important, as it allows progress to be measured. The role of community leaders is critical in determining when and how people evacuate. Leaders include those who may not have a formal position but who nevertheless have influence in their communities.

Are government agencies and NGOs adopting opposite, polarised approaches?

- Governments are the key initiators of warnings. The role of NGOs and local communities is secondary.

- People from some country contexts feel strongly that a top-down approach is needed in order to remedy the fragmentation of decision making and funding support that occurred after the 2004 Indian Ocean tsunami.

- One person felt strongly that governments should be the ones to manage NGO resources.

- A mixture of both top-down and bottom-up approaches is needed in order for programmes to be effective at the community level.

RESPONSE CAPABILITY

Is there a lack of human resources, knowledge, experience and skills relating to disaster risk management at the sub-national level?

- Programmes aimed at strengthening response capability tend to focus on single rather than multiple hazards, and are limited to token preparedness programmes or training efforts that do not appreciate the diversity of responses needed for different hazards.

- Response capability can be enhanced through the sensitisation of young people. Starting with primary education, volunteer groups can be established which then continue the sensitisation of the public.

- Early Warning Systems must have built-in feedback mechanisms to decision support systems to enable adaptation to the unfolding of events at a local level.

Is there a lack of political will to engage in disaster risk management?

- A key part of response capability is what people can do for themselves by developing community-led disaster training and community-led disaster teams.

- There is no contradiction between capacity building through awareness raising and inspiring people to help themselves. How can people be inspired to help themselves without some form of engagement with others? The challenge is in actually doing the work.

- Platforms must be created for social networks to evolve and to share knowledge in guiding the design of the sensors, the earthquake and tsunami detection system, and the decision support system. This can help to identify appropriate measures of time delay, 'overshoot' and 'allowed tolerance' during community response.

- Poor people tend to be more concentrated in high-risk coastal zones and may not have opportunities to leave. Poverty and a lack of resources mean that response capacity is very low. This turns into havoc after a hurricane or cyclone, and communities are caught in a downward spiral.

Is more guidance from the national government needed?

- While response capability depends on the community's capacity to mitigate risk, effective support from the government is necessary. However, government projects are often insufficient, and there is a need for joint planning that will integrate the saving of lives, the minimisation of suffering, and support for livelihood and community programmes.

5 CONCLUSION: PARTICIPATION IN DEVELOPING EARLY WARNING SYSTEMS IN THE INDIAN OCEAN REGION

The dialogue was designed to provide an opportunity for mutual experience sharing and reflection on the findings from the participatory assessment. It was not intended to arrive at a consensus or a set of shared conclusions and recommendations, and we have therefore chosen to present the key contributions from the participants, with little interpretation from us, the hosts.

The online dialogue supported many of the findings of the earlier stakeholder assessment and provided additional insights. Based on this combined evidence, Thomalla et al. (2009) summarise their conclusions and recommendations for strengthening early warning system-community linkages.

As organisers and moderators of the dialogue, we make some final observations here on the experience:

1. The dominant pattern in the responses on the theme 'technology versus community' indicated that existing technologies for early warning may be adequate, but that community organisation is more important than investing in hi-tech solutions. Most of the participants supported the view that effective Early Warning Systems will be particular to each situation and that there is no 'one size fits all' solution.

2. Building on the outpouring of international goodwill for victims of the tsunami, organisations and governments are working hard to build better institutions and systems, often in joint efforts. However, participants sometimes engaged in vigorous exchanges as differences of opinion emerged, often between staff of government agencies and those of NGOs. Such differences of opinion highlighted an ongoing negotiation between the government and non-government sectors as each seeks to play an effective role in the development and maintenance of Early Warning Systems in the region.

   A number of private sector organisations are also making valuable contributions to community-based disaster preparedness. This situation shows that Early Warning Systems are embedded in longer trajectories of social change in society and communities, local realities and power structures, and that better mechanisms are needed to negotiate and coordinate the roles of different actors and to decide on joint strategies and targets that also address other priorities at the local level.

3. Comments made in the dialogue have many implications for further work and resourcing needed at the local government level. Participants frequently suggested a greater role and more support for local government, as a mediator of national priorities and realities at the grassroots level. This should be an important consideration when developing plans for further work on Early Warning Systems in the region.

4. Pro-participation views tended to propose that everything should be made available to 'the community', even technical data and simulation models. There were also more nuanced accounts of how procedures and protocols for early warning can be adapted effectively for local usage. One example of this came from KOGAMI, a community-based organisation in Padang in West Java, Indonesia, that had developed evacuation requirements based on three simple criteria – strong tremors such that people cannot stand up, lasting more than one minute, along with buildings that are broken or collapsed. This kind of 'interpretation' of general procedures and guidelines for community action seemed to be particularly useful and effective.

5. Responses from the dialogue particularly emphasised that poverty, marginalisation and other socio-economic causes of hazard vulnerability have not been sufficiently addressed. The establishment and maintenance of Early Warning Systems must hence take account of the socio-economic context and be based on a solid understanding of peoples' vulnerabilities to a range of hazards and other shocks and surprises.

While these are truisms, nevertheless the dialogue was a useful exercise that broadened the scope of the initial participatory assessment to a wider audience over an extended period of time.

Conclusions arising from the dialogue must be tempered by knowledge of who took part. Almost half of the participants were from NGOs, whereas

government officials represented less than one-quarter of the participants. Responses to an evaluation survey at the end showed that almost half of respondents had visited the dialogue more than once a week, while most others had visited at least once a week. This was so even though many of those registered did not post their own message to the dialogue. (A count of postings at the end of the six-week dialogue showed that one in five participants had actually posted messages.) Most respondents to the survey - 95%, or all but one person - said they had found the dialogue 'useful' or 'very useful' for their own learning.

COMMENTS FROM THE EVALUATION

"It's really good to get people's ideas on early warning. This practice should continue and appear as a blog on screen, so that everyone can participate."

"...partners in developed countries should work more on EW with the developing nations rather than focusing on emergency response only."

"Just expand the areas of coverage and focus explicitly on fresh topics."

"A certificate may be provided to all participants who have posted useful information."

"More web visibility so there will be more sharing."

"I tend to prefer email-based discussions, rather than having to log in to post – but I might be in a minority."

REFERENCES

UNISDR/PPEW (2009) Platform for the Promotion of Early Warning, www.unisdr.org/ppew/ppew-index.htm

Thomalla, F., Larsen, R.K., Ahmed, A.K., Ravesloot, B. and Tepa, C. (2008) *From Knowledge to Action: Learning to Go the Last Mile: Participatory Assessment of the Enabling Conditions for Implementing Community Based Early Warning in the Indian Ocean.* International Conference on Tsunami Warning, Towards Safer Coastal Communities, Bali Indonesia, 12-14 November 2008.

Thomalla, F., R.K. Larsen, F. Kanji, S. Naruchaikusol, C. Tepa, B. Ravesloot and A.K. Ahmed. (2009) *From Knowledge to Action: Learning to Go the Last Mile. A Participatory Assessment of the Enabling Conditions for Strengthening the Technology – Community Linkages of Tsunami Early Warning Systems in the Indian Ocean*. Research Report, Stockholm Environment Institute, Macquarie University, Asian Disaster Preparedness Centre, and Raks Thai Foundation, November 2009.

APPENDIX 1: LINKS TO ONLINE RESOURCES REFERRED TO BY PARTICIPANTS IN THE ONLINE DIALOGUE

RISK KNOWLEDGE

http://kogami.multiply.com

http://www.fao.org/WAICENT/FAOINFO/SUSTDEV/CDdirect/CDre0026.htm

http://www.firstmilesolutions.com

http://ccb.colorado.edu/galapagos

http://ccb.colorado.edu/warning

http://ccb.colorado.edu/book_headsup.php

http://www.emeraldinsight.com/Insight/viewContentItem.do;jsessionid=8E1969B64621E628E0575FB0721CDD52?contentType=Article&contentId=1775808

http://www.zef.de/module/register/media/2efd_GITEWS-Lassa-2009.pdf

http://www.zef.de/module/register/media/d614_Lassa-Tsunami-Early-Warning-System.pdf

http://www.thejakartapost.com/news/2008/11/27/warning-system-about-people.html

http://www.informaworld.com/smpp/content~content=a906252186~db=all~order=page

http://www.zef.de/module/register/media/407b_Governance-of-sustainability-of-EWS.pdf

http://www.gdnonline.org

http://www.islandvulnerability.org/docs/vulnres.pdf

http://www.islandvulnerability.org/docs/vulnrescritique.pdf

http://lirneasia.net/2009/05/vhn-training/

http://www.sahana.lk/wiki/doku.php?id=dev:msg_archi

http://www.ilankelman.org/miscellany/NaturalDisasters.rtf

MONITORING AND WARNING SERVICES

http://www.ilankelman.org/articles1/kelman2006warning.pdf

http://www.oasis-open.org/committees/download.php/14759/emergency-CAPv1.1.pdf

http://en.wikipedia.org/wiki/Common_Alerting_Protocol

http://ccb.colorado.edu/book_headsup.php

DISSEMINATION AND COMMUNICATION

http://kogami.multiply.com

http://findinghighergroundfilm.com

http://www.amandaripley.com/book

http://www.ilankelman.org/articles1/gobags1.pdf

http://lirneasia.net/2007/09/the-role-of-telecom-operators-and-broadcasters-in-a-national-public-warning-system/

http://www.emeraldinsight.com/Insight/viewContentItem.do;jsessionid=8E1969B64621E628E0575FB0721CDD52?contentType=Article&contentId=1775808

http://www.lirneasia.net/wp-content/uploads/2008/03/jakarta-hazinfo-workshop-agenda.pdf

RESPONSE CAPABILITY

http://www.riskred.org

http://www.riskred.org/schools.html

http://www.fragilecologies.com/may15_06.html

APPENDIX 2: PARTICIPANTS IN THE ONLINE DIALOGUE ON EARLY WARNING, 13 MAY TO 30 JUNE, LISTED BY ORGANIZATION

While some participants readily identified themselves as part of a government agency, NGO or research organization, others chose to make their comments as individuals. This list is based on information provided by participants in the registration process. It does not imply any endorsement by these organizations of the views expressed in the forum.

Organisation	Country
Academia	Philippines
ASEAN Disaster Preparedness	Cambodia
Architectural Association	United Kingdom
Arora's Healthcare and Education Foundation	Pakistan
Asian Disaster Preparedness Center	Cambodia
Asian Disaster Preparedness Center	Thailand
Australian-Pacific Centre for Emergency and Disaster Information	Thailand
Australian Agency for International Development	Indonesia
Australian Conservation Foundation	Indonesia
Baluchistan Rural Support Programme	Pakistan
Bodhikalasamskarikasamithy	India
Buklod Tao	Philippines
Camarines Sur State Agricultural College	Philippines
CARE	Bangladesh
CARE	Thailand (Raks Thai Foundation)
Center for Disaster Mitigation	Indonesia
Center for Disaster Preparedness	Philippines
Center for Environmental and Geographic Information Services	Bangladesh
Center for International Climate and Environmental Research	Norway
Centre for Risk and Community Safety	Australia
Commissionerate Of Health Services	India
Consortium for Capacity Building	United States of America
Department of Health	Philippines
Department of Meteorology and Hydrology	Myanmar
Deutsches Komitee Katastrophenvorsorge	Germany
Disaster Management Center	Sri Lanka
Durham University	United Kingdom
Eathing	American Samoa
Emmanuel Hospital Association	India

Fida International	Finland
Food and Agriculture Organization	Ethiopia
Food and Agriculture Organization	Madagascar
Geological Survey Institute	Indonesia
German Technical Cooperation	Indonesia
Gono Unnayan Prochesta	Bangladesh
Green	Iran
Indian Institute of Technology	India
Indian National Centre for Ocean Information Services	India
Indonesia Tourism Council	Indonesia
Institute of Physics	Azerbaijan
International Federation of Red Cross and Red Crescent Societies	Cambodia
International Federation of Red Cross and Red Crescent Societies	Indonesia
International Federation of Red Cross and Red Crescent Societies	Malaysia
International Federation of Red Cross and Red Crescent Societies	Sri Lanka
Johanniter International Assistance	Indonesia
Junior Chamber International	Philippines
Kaladan Press Network	Bangladesh
Kings College London	Great Britain
Komunitas Siaga Tsunami	Indonesia
LINGKAR Association	Indonesia
LIRNEasia	Sri Lanka
Macquarie University	Iceland
Macquarie University	Australia
Malteser International	Germany
Masyarakat Penanggulangan Bencana	Indonesia
Masyarakat Relawan Indonesia	Indonesia
Medialinks	Indonesia
Ministry of Agriculture and Cooperatives	Nepal
Ministry of Environment and Forests	Bangladesh
Ministry of Public Health	Afghanistan
Mountain Forum Himalayas	India
Naga College Foundation - Typhoon Preparedness Center	Philippines
National Committee for Disaster Management in Phnom Penh	Cambodia
National Emergency Management Organisation	Saint Lucia
National Forum of Organizations Woking with the Disabled	Bangladesh
National Institute of Disaster Management	India
National Remote Sensing Center, NSRO	India

New International School of Thailand	Thailand
NOAA Forecasting &Warning	United States of America
Northumbria University	United Kingdom
Online Universal	India
Oxfam	Cambodia
Oxfam	Indonesia
Penn State School of International Affairs	United States of America
Perkumpulan Japesda	Indonesia
Phil DRR Network	Philippines
Philippine Atmospheric, Geophysical & Astronomical Services Administration	Philippines
Plan International in Asia	Myanmar
Practical Action	Nepal
Primary Health Care	Maldives
RedR UK	Sri Lanka
Risk Red	Turkey
Royal University of Phnom Penh	Cambodia
Rural Development Project	Pakistan
Sakhi Samudaya Kosh	India
Stanford University	United States of America
Stockholm Environment Institute	Sweden
Stockholm Environment Institute	Thailand
United Nations	Zimbabwe
United Nations Development Programme	India
United Nations Development Programme	Indonesia
United Nations Development Programme	Thailand
United Nations International Strategy for Disaster Reduction	Tajikistan
United Nations Office for Outer Space Affairs	Austria
United Nations University	Germany
United Nurses of Children's Hospital	South Africa
Universitat Internacional de Catalunya	Spain
University College London	United Kingdom
University of Ibadan	Nigeria
University of Khartoum	Sudan
University of Kiel	Germany
University of Milano Bicocca	Italy
University of Washington	United States of America
University of Padjadjaran	Indonesia
Wasede University	Japan

Western Survey for Seismic Protection	Armenia
World Society for the Protection of Animals	Thailand
World Vision	Ethiopia
Yayasan Tanggul Bencana Indonesia	Indonesia

Individuals	Bangladesh
	India
	Indonesia
	New Zealand
	South Africa
	Thailand
	United States of America

APPENDIX 3: HOW TO SET UP A SIMILAR ONLINE DIALOGUE

SETTING UP THE FORUM

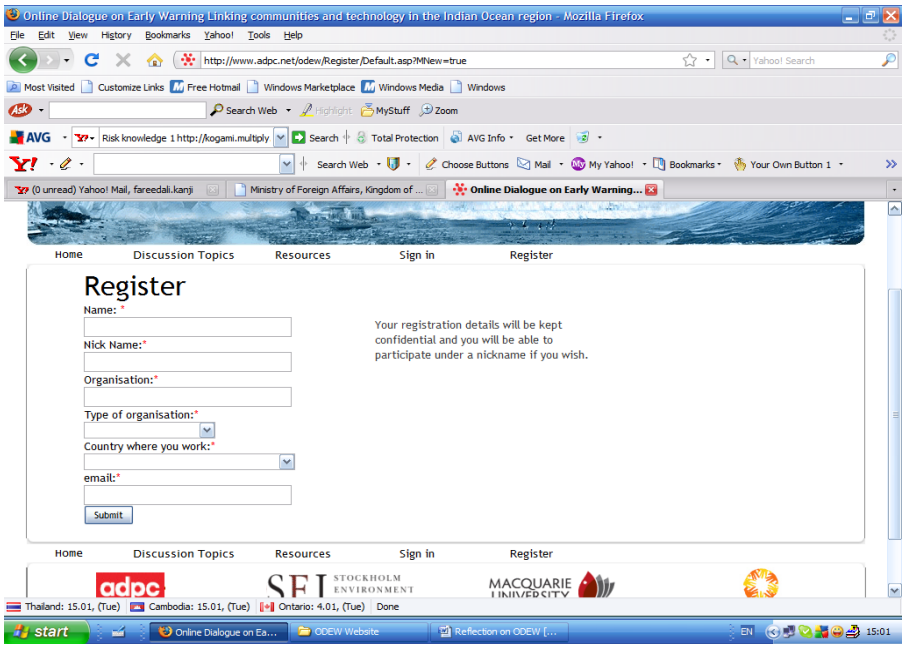
Web forums have been around for some time, and many people are by now accustomed to interacting and leaving comments via this electronic medium. Nevertheless, for research and development agencies such as ours, organizing a public event entirely online was somewhat new. There were many questions and issues to be discussed in terms of how to make the forum popular and how people would feel about using such a medium for the discussion of early warning. The web pages were developed by a small working group made up of staff from SEI, Macquarie University, ADPC and the Raks Thai Foundation who also acted as discussion facilitators. In addition, ADPC employed a consultant who acted as the website's administrator.

These are our reflections on what we learned in the course of setting up the forum, and some recommendations for the next.

First, we thought about how people would be likely to interact in this electronic medium, and considered the extent to which the forum would be open to all. Initially, we asked users to register and sign in before they could read or write messages; later we changed this requirement, so that all visitors to the dialogue could read it, and would only have to register if they wanted to add a comment. We had the idea that viewing the discussion content would perhaps attract more people to take part in the forum, who would otherwise not take the few minutes needed to register.

Further discussion arose about confidentiality and what information should be asked from people in order to ensure an acceptable level of accountability. We tried to limit the number of questions and complexity of the registration process so as not to discourage people from participating. Finally, it was agreed that each registrant should first provide their full name, nickname, organization, type of organization, country and email, and then the registrant would set up a custom password to be used with their email address to sign in. All information was kept confidential by the team, with only the nickname and country appearing with the messages for all to see.

Another aspect of the set-up was the question of how discussion topics should be grouped. Which would work better – a small number of general and wide-ranging discussion topics, or a larger number of topics with a narrow focus? After consultations within the group, the initial plan of setting up 14 separate discussion topics was modified, as this would not only



have required many clicks to access content, but may also have spread the discussion content too thinly thus reducing opportunities for general comments and linkages across discussions. Instead, we created four topics corresponding to those categories widely used in the field of disaster preparedness: risk knowledge, monitoring and warning services, dissemination and communications, and response capability.

Many questions were asked about the structure and use of the web pages. Should messages be displayed in order of their posting, or should the most recent messages be viewed first? How much text is too much for people to absorb? Could the number of clicks for access to the forum be limited? To what extent should facilitators be able to modify the content of messages? There were also further discussions about how to increase user-friendliness.

Some of these questions were answered only after the first messages to the discussions were posted. The registration process was revised to require as few clicks as possible and the introductory text on the homepage was reduced. Initial spam messages were swiftly dealt with by ADPC, as was a technical problem which caused messages to be cut short whenever quotation marks were used. Later, the process for posting messages was modified so that a new window would appear allowing participants to view previous posts while composing their own message. Another modification was the removal of the time limit for composing new messages. Although facilitators were able to delete any messages in their discussions which they felt to be inappropriate, this was not needed since no inappropriate messages were posted.

Sometime after the launch of the Online Dialogue for Early Warning, it became apparent that a resource page was needed. This was then was added to the website. The page listed all the online resources referred to by participants in their postings, and included a table of those key events related to early warnings that have taken place since 1990.

Recommendations:

- Test such forums with a small user group before going live.
- Ask participants which organization they are with, and keep this information confidential.
- Allow facilitators to be able to delete postings in case of abuse.
- Keep explanatory text as brief as possible.
- Allow participants to read messages without registering or signing in.
- Post messages in reverse chronological order.
- Collect only really necessary information during the registration process.
- If a timeout limit is implemented, ensure sufficient time is allowed so that users are not cut off while composing their message. Many people require at least 20 minutes or more.
- Open a new window when composing new messages so participants can view messages and write new ones at the same time.
- Keep the home page to one screen so as to minimize scrolling, and ensure that the discussion links are immediately visible.

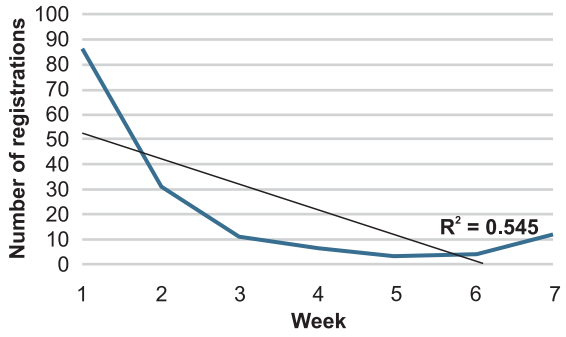
ATTRACTING PARTICIPANTS

Participants were attracted by using email invitations and web announcements on specialist disaster preparedness websites. Responses to SEI's email invitations were tracked using MailChimp software, which showed a response rate of 15.3% to the initial mail-out.

The average response rate for 1,122 industry-specific campaigns studied by the Direct Marketing Association of the USA was 2.61% (cited in a web forum at www.marketingprofs.com) [1].

In general, the rate of registrations declined over time and then rose slightly in the final week as a follow-up email reminded recipients of the deadline.

1 This source, known only in the forum as 'blue pepper', suggested that within sectors, non-profit fund-raisers enjoy the most success with direct response, getting rates of 5.35%. Close behind are retail stores (with 3.36%) and establishments selling services to businesses (3.34%). Manufacturing delivers 3.17%; personal and repair services 3.07%; and travel 2.98%. The two sectors at the bottom of the list - computer/electronic products and packaged goods - still get better than a 2% response.



Recommendations

- Use mailing software to enable tracking of responses as this will give a good guide as to what mailing strategies are successful.
- Use specialist websites and email groups since these are also important in attracting participants.
- Review lists of personal contacts to develop email groups for targeted communications.
- Telephone key individuals and invite them to take part.
- Consider the usefulness of coupling the web forum with a face-to-face meeting, as a way of providing additional discussion 'space' to a group of participants who already know each other. When social ties have been established through other means, participation is likely to be more vigorous and meaningful.
- Establish and implement invitation strategies prior to launch.
- Undertake the follow-up of correspondence to let registered participants know when the forum is about to close, so that they have time to post a final message.
- Acknowledge all messages in a timely manner, particularly in the beginning when momentum has not yet been established.

MODERATION OF DISCUSSION

Content

Facilitators used a list of questions and SEI provided written protocols to guide them in their online interactions - for example, suggesting summaries of the discussions to be made on a weekly basis, and encouraging the use of individual introductions and affirmations of each participant. Through discussion, the style of the initial content was modified to become more conversational and more in keeping with the type of social interaction which the forum wished to promote.

The moderators acknowledged each participant's contribution by name. One of their key tasks was to clarify and reflect back to participants the main strands in the discussion.

Momentum

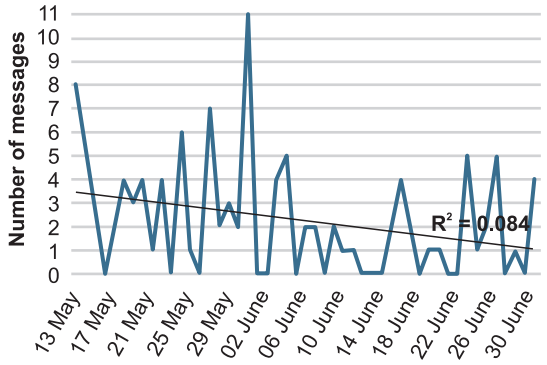
Most comments were made in the first three to four weeks of the dialogue. The frequency of postings declined over time. One technical problem that may have dampened participation was that some postings were being cut short during the first week. Although this problem was quickly fixed, most of the people affected did not repost their comments, even though individual emails were sent to them apologising for the problem and inviting them to repost.

In the third and fifth weeks of the dialogue, SEI sent two rounds of follow-up emails inviting registered participants to return to the dialogue. The first follow-up email had a response rate of 14.9%, similar to the response to the targeted invitation made by SEI. The second follow-up email had a lower response of 10.7%.

In the future it may be best to limit the time frame to four weeks or less – it could be that it is inherently difficult to maintain focus in a long-running dialogue.

Recommendations

- Limit dialogues to three to four weeks.
- Be active in facilitating the dialogue.
- Prepare discussion material well in advance.
- Ensure active facilitation particularly in the first few days, and that the website functions smoothly.
- Acknowledge participants by their chosen nicknames, and where possible refer specifically to their messages.
- Acknowledge divergent points of view where they occur and encourage others to participate in the debate.
- Encourage participants to link their comments with their experiences.



CLOSING AND EVALUATION

A count of postings at the end of the forum showed that 20% of registered participants had posted comments to the dialogue – the others were 'silent partners'. The evaluation survey results, however, suggested that many of these silent partners were nevertheless following the discussions closely. Of the 25 responses to the evaluation survey, although 17 said they had never posted a message to the dialogue clearly they had still been interested enough to fill out the survey.

In the survey, participants gave the following reasons for not having posted a message:

Not being able to work out how to post a message	38.9%
No time	22.2%
Internet connection timed out	11.1%

Two people gave individual answers indicating they were unfamiliar with the use of the internet in this way, and one person was not comfortable leaving comments on a public site.

Almost half of the respondents had visited the dialogue more than once a week, while most others had visited at least once a week. Overall, most respondents to the survey – 95%, or all but one person - said they had found the dialogue 'useful' or 'very useful' for their own learning.

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