Early Warning → Early Action:
A Regional Guideline for Effective Engagement

ASIA PACIFIC ZONE
SOUTH EAST ASIA REGIONAL OFFICE

International Federation
of Red Cross and Red Crescent Societies

The International Federation's Global Agenda (2006–2010)

Over the next two years, the collective focus of the Federation will be on achieving the following goals and priorities:

Our goals

Goal 1: Reduce the number of deaths, injuries and impact from disasters.

Goal 2: Reduce the number of deaths, illnesses and impact from diseases and public health emergencies.

Goal 3: Increase local community, civil society and Red Cross Red Crescent capacity to address the most urgent situations of vulnerability.

Goal 4: Promote respect for diversity and human dignity, and reduce intolerance, discrimination and social exclusion.

Our priorities

Improving our local, regional and international capacity to respond to disasters and public health emergencies.

Scaling up our actions with vulnerable communities in health promotion, disease prevention and disaster risk reduction.

Increasing significantly our HIV/AIDS programming and advocacy.

Renewing our advocacy on priority humanitarian issues, especially fighting intolerance, stigma and discrimination, and promoting disaster risk reduction.

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Abbreviations and acronyms

CAP	Common Alerting Protocols
CBAT	Community Based Action Team
CBDRR	Community Based Disaster Risk Reduction
CCFSC	Central Committee for Flood and Storm Control- Viet Nam
CRC	Cambodian Red Cross
DFID	Department for International Development- United Kingdom
DRR	Disaster Risk Reduction
EWS	Early Warning System
HFA	Hyogo Framework for Action
IDNDR	International Decade for Natural Disaster Reduction
IFRC	International Federation of Red Cross and Red Crescent Societies
INGO	International Non-Governmental Organization
ISDR	International Strategy for Disaster Reduction
MRC	Mekong River Commission
NCDM	National Committee for Disaster Management
NGO	Non- Governmental Organization
NS	National Society
PMI	Palang Merah Indonesia (Indonesian Red Cross)
PNS	Partner National Society
RCRC	Red Cross Red Crescent
RCV	Red Cross Red Crescent Volunteers
SNAP	Strategic National Action Plan
VCA	Vulnerability and Capacity Assessment
VNRC	Viet Nam Red Cross

Definitions of Key Terms

Disaster Risk Reduction:

"The conceptual framework of elements considered with the possibilities to minimize vulnerabilities and disaster risks throughout a society, to avoid (prevention) or to limit (mitigation and preparedness) the adverse impacts of hazards, within the broad context of sustainable development"

– *International Strategy for Disaster Reduction, 2004*

Early Warning Systems:

"The set of capacities needed to generate and disseminate timely and meaningful warning information to enable individuals, communities and organizations threatened by a hazard to prepare and to act appropriately and in sufficient time to reduce the possibility of harm or loss"

– *International Strategy for Disaster Reduction, 2004*

Natural Hazards

Natural hazards, including drought, flooding or even tsunamis, do not always result in disasters. A disaster occurs "only if a community or population is exposed to the natural hazard and cannot cope with its effects".

– *International Strategy for Disaster Reduction, 2004*

Early Warning -> Early Action:
A Regional Guideline for Effective Engagement in Early Warning Systems

The purpose of this guideline is to provide guidance to the National Societies on effectively enhancing and supporting Early Warning Systems (EWS) in their respective countries, particularly at the community level. This publication is meant to identify the current roles and responsibilities of National Society at various levels, including volunteers, and identify how these positions could be enhanced to promote EWS. This guideline is also meant to promote EWS advocacy and awareness raising, identify challenges for end-to-end EWS, and encourage the building of capacity for community-level EWS activities.

Section 1: Introduction

Communities face the risk of disasters like never before, but effective early warning systems can save both lives and property. The United Nations International Strategy for Disaster Reduction (UNISDR) has suggested that death tolls from disasters have declined primarily due to the implementation and maintenance of early warning systems and disaster preparedness activities.

The region of South East Asia is prone to multiple hazards, and as such, is in great need of sustainable and effective Disaster Risk Reduction (DRR) programming, including early warning systems (EWS), to reduce vulnerability and build resilience in communities.

There has been a notable increase in the number of large scale disasters in Asia over the past few years, including the 2004 Indian Ocean tsunami, the 2006 Yogyakarta earthquake, landslides in the Philippines, and Cyclone Nargis in Myanmar in 2008. During one week in late 2009, Asia Pacific was struck by four major disasters.

The losses from these events, as well as other recurring disasters in the regions, could have been reduced with stronger development and DRR efforts focusing on the vulnerabilities of communities, but would have been even more catastrophic if it had not been for existing EWS.

While each country has individual levels of risk, South East Asia is generally prone to flooding, drought, landslides and cyclones. Specific areas are also vulnerable to tsunamis, volcanic activity and earthquakes. Communities need EWS that take a multi-hazard approach, and that can forecast risk on short timescales (for example, a few hours of tsunami warnings) as well as longer timescales (for example, monitoring the risk of drought over a period of months).

The ISDR's 2005 Hyogo Framework for Action, includes goals and priority areas on how to reduce risk. While elements of EWS support multiple areas of the agreement, they generally fall under the Priority for Action 2: ***'Identify, assess & monitor disaster risks & enhance early warning'***.

Warning those in danger. To take the disaster warning "the last mile" to the members of a community is crucial in reducing disaster risks. Romeo Arias has the skills and tool to do it. Romeo participated in a Red Cross, DIPECHO-funded, Integrated Community Based Disaster Preparedness Programme-training in June 2008. He learnt warning techniques, search and rescue as well as first aid and cardiopulmonary resuscitation. Romeo has passed on his skills to five other members in Tagumpay barangay, Palawan province. Photo: Erik Olsson/ IFRC

EWS serve to reduce vulnerability to the impact of disasters. In order to be effective, EWS need to be inclusive, flexible and sustainable, and have the interest and support of communities, volunteers and government officials. While already identified as core partners in EWS, there is still a need to strengthen the capacity of the International Federation of Red Cross and Red Crescent Societies (the Federation) and National Societies of the Red Cross and Red Crescent, as well as other recognized partners including governments, to support EWS. This guideline outlines the main discussions on EWS relevant to targeted countries and identifies roles and actions that can be taken by national societies (NSs) staff and Red Cross volunteers (RCVs).

Section 2: Timescales for Hazard Warning

Hazard events impacting the Asia Pacific region include flooding (including flash flooding), drought, volcanic eruptions, fires, tsunamis, earthquakes, landslides, cyclones/typhoons, and epidemics.

Countries which use a multi-hazard approach to their EWS generally use the same warnings and alerts for all events. However, each type of hazard has its own observation protocol, involving different agencies and types of information, and monitoring and alert activities involve different timelines. For example, earthquakes and flooding are detected using seismic or weather information from different agencies. This information is monitored over long periods of time (months to years), but when a warning is issued, alerts and updates can be sent every few hours to and from communitites.

Multi-hazard EWS approaches minimize the challenges of system maintenance, the amount of staff needed to monitor risk, and confusion over where to go for information. When a multi-hazard system is developed, it needs to consider:

- a range of **timescales**
- a range of **spatial scales**
- different types of **information** (seismic patterns, weather patterns)
- different types of relevant **actions** for alerts and warnings

Every monitored hazard also needs to be categorized by:

- duration of **time** (when did the event begin, and how long did it last)
- **intensity** (for example, how strong is the earthquake)
- **frequency** (how long did the event occur for)
- **location** (what geographic area did the event occur over),
- **cause** (why did the event occur, i.e.. meteorological, geological, climate-related reasons)

Quick-onset hazards (such as landslides or volcanic eruptions) requiring education campaigns before events to ensure that populations can recognize warning signs and respond to accordingly.

Slow-onset hazards, including drought, also require education campaigns but do not need the same type of immediate warning and response periods.

IFRC's 2008 'Early Warning, Early Action' publication dictates that even the same type of hazard can have short, medium and long-term examples of early warning. Figure 1 illustrates how flooding can require early warning activities and actions ranging across a timeline of hours to years. Timelines can be developed for each type of hazard, often with long-term observations and data gathering leading to medium and short-term issuing of warnings and forecasts. Timescales for prevention and mitigation activities then lead to preparedness and response efforts, each a part of disaster management and EWS efforts.

EWS act over periods of time ranging from hours to months, as different stages of warning occur. For example, for cyclones (also known as typhoons), a four-stage warning system is often used:

- **Watch** (the first stage) is issued approximately 72 hours before the cyclone is expected to make landfall
- **Alert** (the second stage) is issued approximately 48 hours before landfall
- **Warning** (third stage) is issued 24 hours before landfall
- **Post Landfall warning** (the fourth stage) is generally issued from 12 hours before landfall to the end of the cyclone

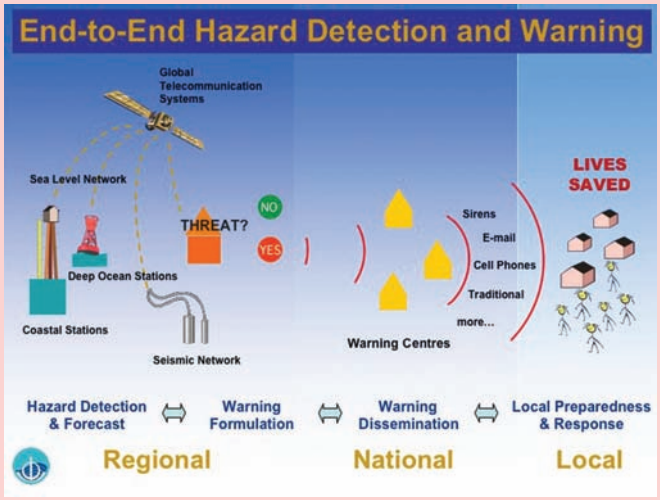
Example 1: Flood	Example of early warning	Example of early action
Years	Increasing risk of extreme rainfall due to climate change	Continually update risk maps and identify changing vulnerable groups, recruit additional volunteers, establish new areas of work, work with communities to reduce risk through concrete areas of action like reforestation, reinforcement of houses, etc.
Months	Forecast of strongly above-average rainfall for the coming season	Revisit contingency plans, replenish stocks, inform communities about enhanced risk and what to do if the risk materializes, e.g. clear drains
Weeks	High ground saturation and forecast of continued rainfall leading to high probability of floods	Alert volunteers and communities, meet with other response agencies to enable better coordination, closely monitor rainfall forecasts
Days	Heavy rainfall and high water levels upstream, likely to result in floods	Prepare evacuation, mobilize volunteers, get warnings and instructions out to communities at risk
Hours	Flood water moving down the river to affected areas	Evacuate

Figure 1: *Timescale for Warning and Action Activities for Flooding (IFRC 2008:4)*

For drought and flooding, warning systems are developed on timescales for each type of hazard:

- **River flooding**, which is considered as a natural part of many watersheds, is monitored closed during flood seasons (over a period of months)
- **Flash flooding and urban flooding however**, are monitored seasonally but attention is also paid to risks caused by heavy rainfall or the opening/closing of dams (which can occur in a period of hours)
- **Coastal flooding**, caused primarily from tropical storms or tsunamis, is monitored over a timescale corresponding with the hazard causing the driving of water inland (such as high winds or waves)

End-to-end EWS are systems which include components which function at all stages of an EWS, from risk analysis to detection of a hazard, dissemination of warnings and then response of those at risk who receive warnings. They are most commonly associated with tsunami EWS, and other systems which require international to local coordination. This type of system can involve feeds of information from regional to national to local levels, at different durations of time, depending on the type of hazard being monitored. The figure below illustrates a flow of and end-to-end hazard detection and warning system, which can be used as a part of a national EWS and DRR plan.



Source of Figure: UNESCO-IOC International Tsunami Information Centre

End-to end systems require the coordination of multiple agencies and expertise, from government agencies and civil society to relevant fields of research and monitoring as well as authorities and first responders. They are often undertaken by multiple international partners who work together on data collection, cross-border preparedness and risk reduction measures. End-to-end systems do not finish when a warning is disseminated, or when the public reacts, but build on local response efforts to feed back information on effectiveness and strengthen the system for the next warning.

Types of drought (meteorological, hydrological, agricultural, and socio-economic) each have particular timescales to be monitored. Agricultural drought can occur at various times throughout growing seasons, or can even become a permanent state. Predictions therefore need to consider short and long range forecasting and trend monitoring.

End-to-end EWS need to be developed so that each portion of the system operates on necessary timelines:

- **Monitoring and data analysis** must occur long-term with attention paid to seasonal trends and climatic fluctuations
- **Warning formulations** use information gathered on trends as well as recorded events to prepare both mid and short-term activities (including disseminating alerts)
- **Warning dissemination** occurs to allow for preparedness and response activities to be undertaken, and, depending on the type of hazard, can dictate that action be taken immediately (such as evacuation from flooding) or in a more steady and slow manner (including preparing food stocks for a predicted drought)

Section 3: Core Elements of EWS

The overall purpose of EWS is to prevent hazards from turning into disasters. This is done by providing information to individuals from community members to government authorities on what risks exist and what can be done to mitigate, prevent and respond to these risks.

EWS must be seen as a system, not only as activities to collect information or issue alerts. The RCRC's role in EWS is to support government counterparts responsible for the creation,

Community Based Action Team (CBAT) is giving warning to the community to prepare before the flood occures in their village – Indonesian Red Cross

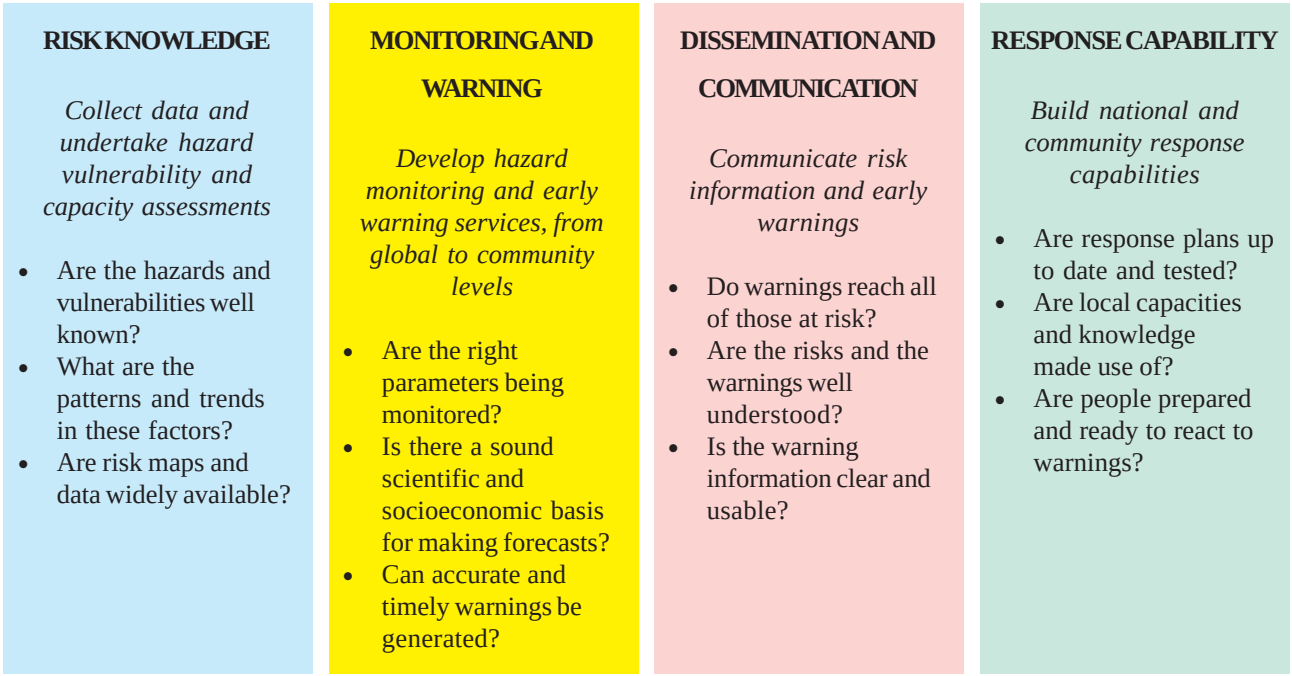


Figure 2: *Elements of Early Warning*

(Adapted from UNISDR http://www.unisdr.org/ppew/whats-ew/basics-ew.htm)

maintenance and functioning of EWS, and advocate for the establishment of EWS at the community level.

As demonstrated in Figure 2, effective early warning systems are comprised of four core elements:

- **Risk Knowledge**
- **Monitoring**
- **Warning Services, Dissemination and Communication**
- **Response Capabilities**

The elements are interlinked, therefore if one fails, the entire system can fail. Different individuals and groups can hold responsibilities relating to different components therefore EWS must be undertaken in a coordinated manner.

Each element of EWS requires information that is:

- accurate
- comprehensive
- coordinated
- timely
- clear

EWS also require commitment from authorities as well as communities to accept their own roles and responsibilities for all components. They need to be supported by broader DRR activities,

including ways to identify and monitor risk from the community to national levels. EWS must also be supported by institutional frameworks and knowledge sharing and training activities.

Risk Knowledge

This component involves hazard identification, risk and vulnerability assessments, as well as capacity assessments. By definition, EWS focus on the 'early', timely nature of disaster risk. This means that we want to know where and when risks start and finish, at least in specific regions and for specific types of hazards (for example, on the onset and duration of flash floods in specific provinces, or the identification the onset of typhoon along set coastal areas).

Information is also needed on processes that influence risk levels, including changes in land and resource use, climate, built infrastructure and levels of urbanization. The starting point for activities in EWS is therefore the collection of risk knowledge, through mapping and analysis exercises, to identify regions and populations at risk, and activities which may change their levels of vulnerability. Information collected through assessments and other exercises will then be used to guide other elements of EWS.

Monitoring and Warning

Monitoring and Warning services are often considered the core of EWS. This component involves risk detection, and requires:

- a sound, updated base of information and resources
- constant monitoring of hazard parameters for forecasting activities

The duration of monitoring depends on the hazards in question. For example, immediate hazards require 24-hour monitoring, however slow-onset hazards which can be detected farther in advance require less consistent monitoring. As the core element of EWS, monitoring and warning activities involve actors (individuals, organizations, agencies) and resources from international to the national and local level, and demand a high level of coordination and commitment. Monitoring and warning services should, wherever possible, be developed in a coordinated way for different hazards in order to share resources and networks.

Bangladesh Red Crescent Volunteers are communicating and calling people to evacuate before the Cyclone SIDR hits the main-land – Bangladesh Red Crescent

Effective warning activities, like other EWS elements, are a crucial component in overall risk reduction systems. One example of where warning systems failed to reduce the impact of a single event was the lack of an effective tsu-

To support emergency response operations, the radio operator plays important roles to collect information and disseminate warning of possible disasters, increase efficiency in disaster response, maintain information and communication line between PMI head-quarters, chapters and branches – Indonesian Red Cross

nami monitoring and warning system for countries affected by the 2004 Indian Ocean tsunami. The number of lives which could have been saved by this type of system demonstrates the urgency behind the creation of EWS for all hazards faced by countries covered in this guideline. Local practices for the monitoring of small scale disasters are also fundamentally important, and can be supported by the RCRC.

Dissemination and Communication

Dissemination and Communication elements require:

- the effective transmission of information on risk
- a continued review to know:
  - if warnings are reaching the relevant people and communities
  - if warnings are understood
  - if the communities know what to do depending on what information they receive

The core rule for dissemination and communication is to be certain, confirm, and confirm again through a different channel of communication that clear and useful warnings reach those at risk to allow appropriate responses to be taken. Communication channels and languages used need to be agreed upon previous to their use.

EWS alert components need to:

- be reliable (accurate, coordinated, operational and timely)
- provide adequate coverage (reaches those in at-risk areas including transient

populations, scalable to expand at-risk areas being covered, accessible and familiar to communities)
- contain the necessary information in a clear manner
- function in the context of emergencies (through multiple channels, when disasters are occurring, recognizing risk levels of other types of hazards, and under situations of stress and limited resources).

Warnings are comprised of two portions:

- an alert (which secures attention)
- a message (which offers information on hazard onset, severity, location, duration and type as well as target population and necessary responses)

Each portion may not be delivered by the same means but should use language and specifications agreed upon during drills and training. For example, a siren could be used as an alert to flooding, but a message would be disseminated through radio, television, SMS, or public posting.

Alerts and messages can be:

- audible (spoken or siren)
- visual (lights or text)
- physical
- distinctive (unique sound or light)
- non-distinctive (i.e. an email, phone call)

All of these should be communicated to responsible persons and people in the at risk community in advance to ensure correct understanding of their meanings.

Dissemination of warnings can be sent through general (mainly mass media) or specific (personalized) means. Examples of tools to disseminate and communicate information on EWS include:

- local receivers (satellite links with audio and/or video)
- radio
- internet
- workshops and meetings
- fixed or mobile information billboards or centers
- traditional means (cultural events, religious gatherings)
- telephone (SMS, land or mobile)
- television and film
- drama and performing arts
- notices (posters, billboards)

- verbal messages
- written media (newspapers, pamphlets, posters)

Response Capability

The element of Response Capability is also dynamic, needing information on how prepared communities are to act both in response to hazards as well as reducing their levels of risk. It further includes structures for emergency management, as well as education and preparedness activities and repeated, timely testing of disaster management plans (i.e. through drills and simulations).

Section 4: People-Centered Early Warning

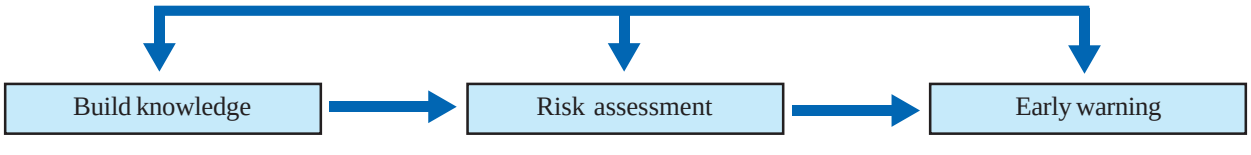
People-centered approaches to EWS focus on the vulnerabilities and capacities of at-risk communities. To be effective, those involved need to have:

- access to information and knowledge
- communication networks
- capacity to respond.

People-centered approaches are promoted in the Hyogo Framework for Action, and already supported in the field by NSs. The approach is illustrated in Figure 3, which outlines the foundations of community-based EWS.

People-centered approaches include the promoting community-based EWS, which have the potential to increase the effectiveness of national EWS efforts. As a component of community-based disaster risk reduction (CBDRR) approaches, along with the appropriate ties to national and provincial/district-level systems, these systems empower communities to take action to react to disasters as well as reduce their overall risk and protect their own well-being where possible. To be effective, they need to include even the most difficult-to-reach populations, groups often marginalized or migratory.

(a) Community involvement in early warning



(b) Community involvement in early warning and development

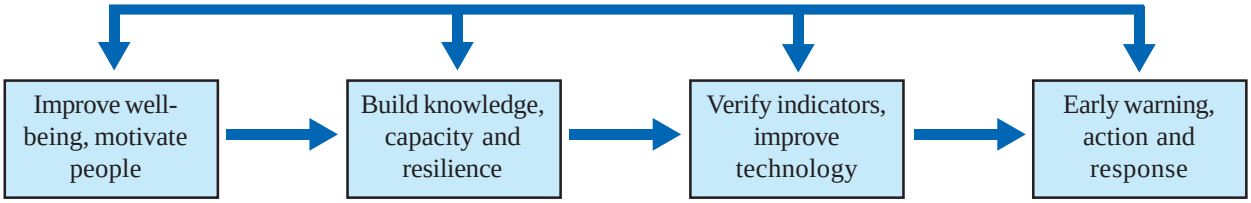


Figure 3: *The foundations of community-based early warning (IFRC 2009: 43)*

At community level, the disaster management command post has served to manage the database and mapping regularly. Aside to this, during disaster occurrence, the command post functions as the field operation control centre as well as disseminate early warning – Indonesian Red Cross

People-centered approaches protect the rights of individuals:

- to know about their own levels of risk
- to be empowered to play a role in the reduction of vulnerability and enhancement of resilience levels of their community

This must occur while still holding the government accountable for their responsibilities in DRR and EWS, therefore people-centered approaches needed to be developed with the support and involvement of relevant authorities.

To avoid duplication, and increase community ownership of activities, people-centered approaches to EWS need to build on existing:

- community groups or networks
- communication and disaster management or risk reduction systems
- local risk knowledge

Communities should see EWS as an investment of their time, interest and resources, and as a component of their broader DRR strategies, including those which target the involvement of youth and other special groups.

Community-based early warning generally includes two stages, as illustrated in Figure 3.

The first stage, involvement in early warning, involves the basic elements of EWS.

The second stage, involvement in early warning and development, demonstrates an underlying building of knowledge and residence. It promotes sustainable development, which is needed to provide strong foundations to the EWS activities.

Important Considerations for Community-Based EWS

- Capacity of stakeholders
  - Knowledge of local authorities on all stages of EWS
  - Training for volunteers, including RCVs, who are involved with the EWS processes (from gathering of information to dissemination and response activities)
  - Mobility of communities and volunteers
  - Training for communities

- Their role in EWS processes
- What is a reliable source of EW information
- How and when to respond to warnings
- How to prepare for events
- Who is responsible from the community to the national level
- Who to go to for more information, or to provide input

- Local beliefs, needs and knowledge
  - Indigenous or local knowledge on risk, previous disaster experiences and EWS-related activities
  - Knowledge of needs and location of all vulnerable populations
  - Understanding of local communication capacity, from languages used to levels of literacy
  - Understanding of cultural practices and beliefs relating to elements of risk, disasters, and EWS
  - Knowledge on local levels of confidence and trust for those involved in EWS, including of RCVs and authorities
  - Traditional media used (i.e. radio) or trusted ways of receiving information (in person or through different forms of media)
- Ease of EWS components
  - Information disseminated in appropriate language
  - Low costs to local level participants
  - Simple and relevant training exercises on EWS usage and response
  - Clear chains of responsibility
  - Volunteers (including RCVs), or others in charge of EWS, explain all elements of the EWS to communities, from preparedness to the type of information which is received, to what to expect in the case of an event and how to react

To be effective, community-based activities have to be composed of individuals from the community who:

- are respected
- have strong interest in seeing activities succeed

These individuals must also be recognized by others in different levels of EWS, from community leaders to the district, provincial and the national level, and they must be trained on how and why to support EWS activities.

Early warning should include awareness on action to be made at different alarm stages and link to community response plan in Kampong Cham province, Cambodia. Photo: Cambodian Red Cross

Red Cross Volunteers and local authority regularly monitor and post updated information during flood season in Kandal province, Cambodia. Photo: Cambodian Red Cross

Community members involved in community-based EWS activities can include and support NS staff and RCVs. The involvement of local level actors and already-committed RCVs:

- increases interest and awareness about risk
- increases the trust and sense of ownership of the community in EWS
- increases community involvement
- increases how many individuals heed warnings
- increases the effectiveness of the entire EWS system

Section 5: Partnerships and Responsibilities in EWS

EWS, Government Responsibility and NSs

It is the government's responsibility to create, maintain, and update EWS. It can be established at the local level, but each government has the responsibility to create a national EWS which are generally comprised of a diverse range of methods and technologies to detect and monitor hazards. They have elements which both collect and analyze data, often on multiple types of hazards, to determine risk levels and event probability. They also include ways to disseminate information to notify populations about possible hazard threats.

Hazard monitoring undertaken:

- within the country involved
- on a regional and international level, particularly with events (such as tsunamis) that require advanced technological support and alert systems, continuous real time data collection, and have impacts for multiple areas

It is usually the responsibility of national-level authorities to take the decision on how to react to information received from international sources, for example issue a tsunami warning. Once this decision has been undertaken, the authorities then use relevant partners and channels to disseminate information and coordinate relevant responses.

It is imperative for authorities from the national to the local level to see NSs and RCVs as supporters of EWSs, but not as responsible for their implementation or success. The NSs should, based on their mandates and capacity, decide the scale of its participation in the EWS. Roles for NS staff and RCVs should be agreed upon in national-level dialogues with government authorities and relevant agencies, and be monitored and updated over time.

NS and RCV representatives should be involved in meetings and workshops on the development of EWS and reviews of their progress at the various levels. Due to the nature of hazards crossing borders, it is important that there are not only national, but also regional and international common practices, shared knowledge, and agreed-upon elements of EWS amongst neighboring regions.

Actors involved in EWS and DRR: A dynamic system

Numerous agencies, organizations and individuals are involved with EWS and DRR activities in each country, from the national to the local level. NSs can advocate for authorities to identify their position in the wider process of EWS, and, to ensure that their involvement complements these roles focusing their facilitation and support activities towards the community level.

NSs and RCVs hold unique roles and responsibilities in different stages of the system, and these positions differ between countries. Each posting has the potential to be active in different EWS-related activities, depending on resources available and agreements made with other relevant actors and authorities. While the core area of activity for RCVs is at the community or village level, their influence does not remain local. In EWS, even local-level actors have the potential to feed information up to national levels, or interpret warnings and alerts for community populations which can even originate from international actors.

Install Early Warning System Equipment – Indonesian Red Cross

School children were evacuated during an emergency simulation exercise – the Thai Red Cross

Section 6: Suggested Actions and Activities for NSs from the Community to National Level

Each NS should clearly understand their responsibilities for different stages of EWS, whether they are national or community-based. The activities and responsibilities outlined here can be used to identify possible areas for engagement. As staffs of NSs go through these lists of suggested activities, they can consider the following questions:

- Is an EWS currently being done in my country? If so, how is it functioning? who is responsible?
- Recognizing that governments must lead EWS processes, how can we as a NS help facilitate or support this type of activity at each stage of the EWS?
- How can our current activities and DRR programming support this activity?
- What resources are needed to be involved in this activity? Do we have all the required resources? If not, how can we fill the shortfall?
- How can we use other existing frameworks, such as the IFRC's 2008 Community safety and resilience and South East Asia Regional DRR frameworks to support EWS activities?
- How can we make sure that our support for EWS considers smaller scale, local disasters as well as broader, large scale events?

Actions and Activities for NSs at the National Headquarters Level

NSs may not have current capacity to undertake these activities. Each NS should therefore take responsibility to go through the list, and identify:

- what actions are currently possible
- what activities require first the building of further support and capacity

Care should be taken to ensure that NS activities support and not lead – activities that are the responsibility of governments, particularly around monitoring activities.

Figure 4 outlines IFRC's summary of the range of scales (across time, space and actions) that need to be considered to promote successful EWS.

Early warning > Early action in a nutshell

Routinely taking humanitarian action before a disaster or health emergency, or in anticipation of a future disaster risk, making full use of different forms of information on all timescales.

- A range of warnings made at local, national, regional and global levels, incorporating information from different sources in support of the needs of vulnerable communities
- A range of timescales, including observations, storm warnings, six-day rainfall forecasts, one-to-two week hazard forecasts, seasonal forecasts, climate scenarios
- A range of spatial scales, including warnings and actions at global, regional, national, district, local and community level
- A range of actions, such as evacuation, volunteer mobilization, moving supplies, people and money, contingency planning, risk mapping, sensitization, risk reduction. Routinely taking humanitarian action before a disaster, making full use of different forms of information on all timescales

Figure 4: *Range of warnings, actions and scales of space and time for EWS (IFRC 2008:12)*

At the National Headquarters Level:

Risk Knowledge

- ✓ Advocate for the setting of standards for systematic collection, sharing and assessment of hazard data nationally and, where necessary, internationally
- ✓ Advocate for, and support, legislation and government policy mandating the creation of vulnerability maps for all communities
- ✓ Agree in advance with agencies responsible for forecasting of hazards and issuing of EW messages on the interpretation or implication of provided information
- ✓ Assist with the coordination of hazard information when needed
- ✓ Join and operate with national networks and working groups involved with hazard vulnerability and capacity assessments with a gender lens on all social groups
- ✓ Monitor the reviewing and updating of risk data in a timely manner (per year, per season, depending on the hazard)
- ✓ Support local or indigenous knowledge and EWS practices with information gathered from available scientific and technical methods of assessment and monitoring, including remote sensing, hazard and climate modeling and forecasting, and ground-based observations
- ✓ Support community-based EWS processes, including local risk assessments such as VCA and other related activities
- ✓ Support the compilation of data from different organizations and agencies, particularly on outcomes from VCAs and EWS programming
- ✓ Support the creation of an integrated hazard map that reflects the risks of multiple types of hazards
- ✓ Support the creation of national hazard maps to identify areas and communities at risk to disasters
- ✓ Support the creation of observation stations for meteorological and hydrological hazards, and provide training so they are used effectively, if appropriate
- ✓ Support the identification of the intensity, frequency and probability of hazards on a national level

Monitoring and Warning

- ✓ Advocate for the standardization of processes, roles and responsibilities for EWS to be established and mandated by law, particularly the issuance of warnings
- ✓ Assist government and other partners to set warning system parameters and protocols for communication and channels for warnings
- ✓ Assist in the collecting of data for parameters documented for each relevant hazard
- ✓ Ensure that all monitoring and warning elements follow relevant international standards and protocol and lobby for other actors to do the same
- ✓ Monitor activity of all NS staff and RCVs to evaluate operational processes including the quality of data gathered and warning performances
- ✓ Participate in the testing of monitoring and warning systems on a timely basis
- ✓ Support the creation and maintenance of regional agreements and coordination mechanisms for cross-border hazards, such as flooding in shared watersheds, and also the sharing of information for exchange and capacity building
- ✓ Support the creation of inter-agency agreements and networks to ensure the consistency of EWS language and communication channels, particularly when different types of hazards are handled by various agencies
- ✓ Support the creation of warning centers with appropriate staff and resources that feed into effective and maintained channels
- ✓ Support the training of personnel to use and maintain technical equipment for monitoring and warning
- ✓ Ensure that NS activities involving monitoring supports the efforts of governments such as NS can be heavily involved in information dissemination, but responsibilities for monitoring should still be taken by government.

Dissemination and Communication

- ✓ Develop a NS guideline for EW procedures to be used at different levels
- ✓ Ensure that NS participation in dissemination and communication activities is consistent
- ✓ Ensure that NS functions, roles and responsibilities in the warning dissemination process are specified in relevant legislation and policies
- ✓ Ensure that the NS supports warning messages that are recognized and understood as well as verifiable
- ✓ NS can support the facilitation of translating messages from technical information to usable, accessible warnings
- ✓ Support in the provision and installation of equipments for communication within the NS with linkage to government system, if appropriate
- ✓ Identify the role of NS in regional or cross border EWS activities
- ✓ Provide information to other actors as necessary to ensure that warning alerts and messages reach all of those at risk, regardless of geographically-specific or cultural needs
- ✓ Share lessons learned across all levels of NS from warning interpretation to challenges or successes in dissemination processes
- ✓ Support and participate in warning dissemination chains enforced through policy and legislation
- ✓ Support the creation and maintenance of communication and dissemination systems at the community level
- ✓ Support the creation of two-way and interactive dissemination systems with NS staff and other identified respondents, to allow for verification of received warnings
- ✓ Support the training and empowerment of volunteer networks for EWS activities such as warning dissemination to even remote communities
- ✓ Support the use of private sector resources where appropriate (i.e. mass media)

Response Capabilities

- ✓ Assist in the conducting of tests and drills on a timely basis to examine the effectiveness of EWS dissemination and response processes
- ✓ Advocate for the inclusion of EWS information in education campaigns and school curricula
- ✓ Assist with strategies to build credibility and trust in warnings through educational activities from community to national levels
- ✓ Evaluate public awareness, education and training campaigns for EWS on a national to community level
- ✓ Participate in mass media and other campaigns (including traditional and indigenous methods) to improve public awareness on EWS
- ✓ Share information with communities and all levels of NS on what sources of information on risk are credible
- ✓ Support the creation and implementation of community and national DRR and EWS strategies including preparedness and response plans
- ✓ Support the creation of hazard maps from national to community levels which can be used for preparedness and response planning
- ✓ Support training for communities and volunteers on response and recovery strategy as well as larger modules on DRR and EWS

At Provincial and District levels:

Risk Knowledge

- ✓ Participate in the coordination of hazard information when needed
- ✓ Support community-based EWS processes, including local VCA and other related activities
- ✓ Assist in the compilation of hazard data to create provincial and district-level hazard maps (using data from communities collected through activities such as VCA)
- ✓ Support the provision of data from communities and provincial/district level officials and actors to national-level bodies
- ✓ Build up and maintain partnership with agencies responsible for hazard forecasting and EW issuing at the same level to ensure effective coordination and cooperation

Monitoring and Warning

- ✓ Network with partners for EWS activities, including local authorities, from the national to local levels, and share information where necessary
- ✓ Support the testing of monitoring and warning mechanisms on a timely basis
- ✓ Support a warning centre at each provincial level that is staffed full time (24/7) and is coordinated with other levels of warning centers
- ✓ Monitor maintenance needed on warning system components on a provincial level (for NSs and RCVs), and feed information on identified needs to national-level officials
- ✓ Support the receiving, processing and availability of data for hazard monitoring in a timely manner, as needed
- ✓ Support forecasting activities at community levels by providing maintenance, transfer of information, fail-safe back-up systems and on-call personnel who can move within and between provinces as needed

Dissemination and Communication

- ✓ Support the creation of effective two-way communication systems, acting as a feed from community to national level actors where necessary
- ✓ Verify when warnings and data have been received by communities and national-level actors
- ✓ Provide redundant and backup methods of information dissemination between national and local levels
- ✓ Support post-dissemination follow-ups to evaluate the effectiveness of communication flows between and within provinces, as well as to communities and national level centers and actors
- ✓ Agree in advance on an alternative communication channel in case of the official one broken down, e.g. with the military or police

Response Capabilities

- ✓ Support the transfer of generated warnings between different actors at local and national levels
- ✓ Check information and verify that it has reached recipients, in order to build trust in the system
- ✓ Ensure that hazard maps reflect the entire risk levels of all communities and areas in each province, including rural areas
- ✓ Keep record of emergency preparedness and response plans for all communities within the province, including contact details of authorities and community leaders, and update when necessary
- ✓ Support and participate in drills to test effectiveness of warning dissemination processes and responses

At community and RCVs levels:

Risk Knowledge

- ✓ Support the creation of vulnerability maps at the community level through VCA
- ✓ Engage in and advocate for community-based EWS processes, including local VCA, risk mapping and other related activities
- ✓ Assist in the creation of an integrated risk map for all relevant hazards
- ✓ Support the consideration of gender, culture, disabilities, access to infrastructure, economic diversity and environmental resource management during the creation of EWS
- ✓ Assist in the reviewing and updating of risk data in a timely manner (per year, per season, depending on the hazard)
- ✓ Assist in the collecting of data on intensity, frequency and probability of disasters, including providing information on historical events
- ✓ Ensure that any indigenous or traditional knowledge on EWS or DRR related activities is documented and included in a relevant manner in planning for future activities
- ✓ Integrate EWS and results of VCA into local development and management plans

Monitoring and Warning

- ✓ Participate in testing and drills of EWS warning and alerts in a timely nature
- ✓ Circulate information on who is responsible for different elements of EWS, including warnings
- ✓ Contribute to the staffing of warning centers (24/7)
- ✓ Advocate for, and support and participate in activities for training local personnel to use technical equipment and ensure it is suited to local conditions
- ✓ Assist in the sending of data when necessary in agreed-upon formats in a timely and consistent manner
- ✓ Support the monitoring of quality of any infrastructure and report if repairs are needed, including to back-up power systems (batteries, generators)

Dissemination and Communication

- ✓ Support and participate in training for EWS with local authorities and other actors to ensure a common understanding of the system
- ✓ Cooperate with local authorities and other bodies in the dissemination of warning messages
- ✓ Support and promote the participation in volunteer networks and advocate for appropriate training so they can receive and disseminate warnings even to remote households or marginalized community members
- ✓ Ensure that communication and dissemination systems are suitable for your community (i.e. radio where it can be accessed, loud speaker systems, messenger runners for remote areas)
- ✓ Support informal communication mediums as a means to back up or double up on other formal communications (i.e. go door-to-door to ensure that messages disseminated over radios have been heard)
- ✓ Involve private sector to secure support for EWS
- ✓ Ensure that messages are in a form and have content that reflects the specific needs of your community (i.e. if there are concerns on livestock, that these are considered)
- ✓ Support the dissemination of end-warnings and feedback on communication quality
- ✓ Agree in advance on an alternative channel for communication with the local authorities and within the NS
- ✓ Create or support mechanisms to report disaster occurrences and impacts from the community level, to be fed upwards
- ✓ Provide information to relevant actors at district and national levels on how people accessed and interpreted warnings, what actions were taken, and any further information useful as lessons learnt
- ✓ RCVs in particular can:
  - ▸ disseminate alerts and warnings
  - ▸ ensure that all vulnerable populations receive warnings
  - ▸ clarify information
  - ▸ be a focal point for reliable information on status, extent and intensity of event

Response Capabilities

- ✓ Assist in the public awareness raising of risks in the community
- ✓ Participate in the development of community-based disaster groups or committees for DRR and EWS such as Community Based Action Team (CBAT), and create a community DRR plan with preparedness and response components
- ✓ Keep DRR and preparedness and response plans up-to-date, practiced, and ensure that all community members are aware and supportive of the strategies
- ✓ Conduct regular tests and drills to test effectiveness of EWS components
- ✓ Assess in a timely nature community ability to respond effectively to EWS
- ✓ Create, facilitate and participate in a community and volunteer DRR education and training program, with components relating to EWS
- ✓ Support educational activities on how warnings will be disseminated, which sources are reliable, what type of information can be expected to be received, and how to respond to different types of hazards once a message is received
- ✓ Train community members to respond to basic hydro-meteorological and geophysical hazard signals to allow for immediate response using indigenous and traditional methods where possible
- ✓ RCVs in particular can:
  - ▸ identify safe routes to shelters during evacuations
  - ▸ protect or relocate assets and resources
  - ▸ act as a focal point for further information dissemination
  - ▸ assist populations to return to identified safe areas
  - ▸ assist the evacuation of individuals with special needs
  - ▸ distribute emergency provisions
  - ▸ act as trusted and easily identifiable focal points for information on how to respond
  - ▸ collect perspectives from community members on effectiveness of EWS response processes

Ready to reduce risks. Warren Joy, 28, has been a Red Cross volunteer for one year. She is trained in disaster response, first aid and hygiene promotion. When typhoon Fengshen (known locally as Frank) struck Antique province in 2008, Joy were among the Red Cross volunteers who assessed the damages in a nearby barangay that was severely flooded. "I want to help people in every barangay in times of disaster", she says. Joy has been trained thanks to the implementation of the Red Cross DIPECHO-funded disaster preparedness programme. Photo: Erik Olsson/ IFRC

Core Actions and Activities for NSs at all Levels

Training and Education for Capacity Building in EWS

A core area of EWS that the NS can become involved in at all levels is the area of capacity building through training and education for both men and women. These activities need to be undertaken with the cooperation and support of relevant agencies and other stakeholders.

The EWS process needs to ensure that communities know:

- what plans are in place
- what the risks are to their areas
- what capacity that men and women in the communities have to reduce such risks at the local level

Training on monitoring and dissemination, as well as the use of new technologies and communication tools, is vital for infrastructure to be used effectively. This training should not only take place at the community level, but should be offered to all personnel working in EWS.

Training and education for EWS involves three different stages:

(1) The identification of information that is needed to promote EWS within communities, increase participation and ensure their safety;

(2) The identification of methods that would work best to share information to and from communities and monitor risks, and;

(3) The carrying out of training and educational programming and activities.

Education on EWS at community and broader levels should be a part of larger discussions on DRR. These programs should not focus on EWS as stand-alone activities. Rather, they should tie into broader conversations on community risk (i.e. basic knowledge on disasters which affect the region), ways to build resilience and response

Advocacy for Community-Based Approaches and Support for RCVs

NSs should see RCVs as:

- A source of vital knowledge of local level vulnerabilities and capacities, including special needs or marginalized individuals
- Being capable of sharing information and assisting with the 'scaling up' of EWS efforts to different communities
- Being strong local focal points for linking warning activities into other programming on disaster preparedness and response, and even broader areas of work including sustainable development

Through building the capacity of RCVs, NS can increase the effectiveness of their work at the community level and also strengthens local resilience, and promotes trust within the Red Cross in these areas.

Accurate EWS serve to support other elements of risk reduction, as they allow communities to predict and prepare for hazards in a timely way. This allows additional measures of preparedness to be linked to hazard prediction such as:

- the protection of resources and stockpiling of supplies
- the evacuation of vulnerable populations to be conducted in a timely and calm manner
- the protection of food security and health

When EWS function effectively, they can provide useful information to agricultural practices, the building of infrastructure and planning for various institutions, including hospitals, schools, and transport networks.

Assessments on the Status of EWS at the Community Level

NSs and RCVs can undertake a nation-wide survey to assess the status of EWS at the community level. Such a survey can be undertaken annually, to identify changes in activities and community needs. Basic questions for the survey ask if each community has:

- A disaster management /risk reduction planning group or committee to act as a focal point for both community members and external actors including government authorities, organizations such as NGOs, private sector etc,.
- Data collected and up-to-date from VCA to identify hazards and determine most at-risk places and people
- Hazard maps to identify areas perceived as prone to hazards
- Evacuation and response plans and maps
- Set warning signals, language, and create appropriate infrastructure for hazard monitoring and alerts
- Drills set up to test and update the community level disaster plan for both emergency and preparedness, as well as risk reduction activities
- Access to training and educational initiatives to keep communities knowledgeable and involved in risk management and EWS processes
- Support for monitoring and assessment exercises of DRR and EWS activities at regular intervals

When receiving early warning information from the meteorology, climatology and geophysics agency, PMI has a strategic function in forwarding and transferring such early warning information to the community using various communication channels – Indonesian Red Cross

- Contact details for those in charge of EWS for their community, as well as relevant district, provincial and national focal points

NSs and RCVs can also ensure that communities know what they have a right to know about EWS. Communities can be told that they have a right to:

- Information about different types of hazards the community is at risk to
- Know how they can prepare for and respond to these events, what community disaster management strategies exist or how one can be created
- Know their rights in regards to broader DRR structures
- Understand how they can reduce their own vulnerability levels
- Know where they can get more information on EWS, hazards and DRR
- Know who is responsible for DRR and EWS systems and relevant contact details
- Know what to expect from EWS such as types of information, language, etc.

Ways that NSs and RCVs can share and collect information on EWS with communities can include:

- Training programs for volunteers and other interested community members or officials
- Educational pamphlets, brochures or printed materials
- Traditional methods of drama, music, arts
- Media and public service announcements
- Evacuation and response drills

Section 7: Drivers and Challenges for EWS

Drivers for EWS

** Increased interest in EWS and DRR in the region*

Driven by an increase in the severity and frequency of disasters, as well as stories of best practices from neighboring countries, both communities and NSs have an increased interest in promoting effective EWS and DRR strategies. All players involved with EWS can take an active role in raising awareness about what makes EWS effective, as well as increasing their understanding their own responsibilities as part of the

Red Cross volunteers provide door-to- door flood preparedness and warning information – Cambodian Red Cross

larger EWS structure. This not only increases awareness of how these systems function, but creates a sense of ownership of individual roles, leading to a strengthened interest in seeing systems function effectively.

** Existence of indigenous or traditional EWS components*

Indigenous methods of EWS have existed in numerous communities before they were 'demanded' by external organizations and bodies. Understanding the foundations of these indigenous systems can highlight particular risks that communities face, as well as grounding new systems in established and trusted practices. Indigenous EWS should be seen as a way that communities can build upon their traditional methods of preparation and response to reduce their risk levels.

Clapping to warn. Pedro Pallad, holds a bamboo clapper, known locally as the "Tala-Tala". When the local Red Cross receives a warning of an approaching typhoon, Pedro and other villagers position themselves in the street corners of barangay Pis-anan, Antique province, to "clap out" a warning signal. The villagers can then seek shelter in the evacuation center (local school). Pedro has been a Red Cross-volunteer since 2003. The community members have been trained in disaster management as part of the Red Cross DIPECHO-funded disaster preparedness programme. Photo: Erik Olsson/ IFRC

** Early warning being approached and considered as a system, and promoting DRR and sustainable development*

With an increase in the amount of interest and educational activities focusing on DRR and EWS are now being considered as more than merely systems of alerts. Looking at early warning as a system supports both the EWS itself as well as broader ways of building community resilience. Activities in EWS at the community level which span from identifying risks to coordinating response efforts increases the communities resilience to not only disasters but also to unsustainable or ineffective development. When local approaches are supported by districts and provinces, this systems approach builds capacity from the community to higher levels.

Infrastructure for all elements of EWS also promotes sustainable community DRR and development activities. For example, when rural communities are provided with radios or other more general means to communicate with other areas and provinces, where allowed, they can use this infrastructure to gather information on other activities which could assist them in building resilience and livelihoods. Even further, as found through DRR activities, when communities are part of risk knowledge and monitoring activities, they develop an understanding of how vulnerabilities evolve, such as through resource use. They also are able to identify particularly vulnerable areas or populations.

** EWS being developed for multiple hazards*

Multi-hazard EWS are needed by NSs as are those relevant to complex disasters such as food security. Existing or new drought and flood monitoring EWS can be used to develop food security EWS for provinces and communities.

EWS which combine drought and food security indicators already exist but are not widely used. They rely on data including rainfall and resource trade, and include activities not only for

Community people actively involve in a tsunami evacuation drill – the Thai Red Cross

monitoring of hazards, but also contingency planning and mitigation activities such as changing crop harvesting and planting patterns and creating community seed banks and household gardens.

Where NSs are already aware of such systems, they can share lessons learned with other stakeholders. Where there is a clear need for these mechanisms, they can support authorities to create multi-hazard and food security EWS for their relevant countries.

** Community-centered approaches are practical in times of climate change*

Countries have increased their support both institutionally and through programming for community-led approaches to both DRR and EWS. Community-based EWS are being developed which include all hazards that the community is vulnerable to, including threats which might develop due to changes in resource management or climatic variability. Communities involved in their EWS have a stronger knowledge of hazard vulnerability, but also more capacity to build resilience and respond to future events.

** EWS are taking into account risks in both rural and urban areas*

By promoting national-level EWS as well as community involvement, countries are considering risk levels that appear in both rural and urban areas of their countries. NSs are supporting EWS in urban areas as well as more remote areas, which is useful in ensuring that both settled and migratory populations are included, and that both sparsely and heavily populated areas have EWS programs.

Both urban and rural environments have a unique set of resources and risks, therefore systems need to be fine-tuned for each surrounding. For example, urban areas with a strong resource base may use ambulances and public address systems to disseminate warning information. In rural areas, information could be relayed over public address systems of infrastructure such as religious buildings (mosques, temples), by bicycle or where needed, by foot. NSs already have the support of RCVs as well as their own staff in both urban and rural areas of many countries, therefore form a strong base to ensure that all landscapes of risk have functioning EWS.

Challenges to effective EWS

Challenges can be encountered through multiple stages of EWS from one to others:

- risk knowledge,
- monitoring and warning services,
- dissemination and communication and
- response.

Core failures of EWS were identified by NSs as being a lack of sustainability and coordination. Here are some challenges:

** Credibility*

In some countries, credibility can be a challenge in effective EWS. Involved organizations, authorities and individuals (including volunteers) need to be trusted, recognized and accepted. Sources of information for EWS also must be expected and trusted. Credibility becomes threatened by contradictions and misinformation including false warnings. A lack of trust can lead to a lack of commitment from communities as well as EWS personnel, a loss of faith in sent and received signals and data, and an eventual failure of EWS. Culturally insensitive or inappropriate practices, insufficient prevention activities, the use of unfamiliar terminology and a lack of sustained support can also lead to failures in trust and credibility.

** Limited resources (physical, social and knowledge)*

To be sustainable and effective, EWS need resources in the form of equipment, can be basic or advanced, staff with technical and operational skills, experience and training, to financial support. They also require knowledge and data on hazard trends, as well as built data amongst those that will monitor and respond to alerts. Insufficient knowledge on what to expect from EWS can be averted by conducting more drills and educational activities at the community level.

Resource use can be shared between different EWS, with one educational activity at the local level covering how to respond to multiple types of alerts, and prepare for various forms of disasters, or fixed infrastructure being used to communicate data on hazards and warnings for different hazards.

** Failures in communication*

Where communication channels fail in EWS, whether in the communication of data or the dissemination of warnings, serious consequences may follow. Ineffective communication efforts can be caused by bottlenecks of information or breaks in flow due to failure by both staff and equipment. Weak coordination efforts amongst a diverse mix of staff and volunteers can lead to information being misinterpreted or lost. If no methods are in place to verify that the proper recipients

PMI has formulated training for community based early warning system which enables community to identify its options for safe behaviour, availability of evacuation route, and the best way to avoid damage and loss of property – Indonesian Red Cross

receive the correct message in a timely manner, EWS can break down.

Failures in communication can also occur due to timing. If information does not flow smoothly, the duration and time of monitoring and warning periods can be incorrect, as can be the duration and time of gathering information. Communication failures can also result in failures in the duration and time of response. Failures can also be forced by a lack of continuity in communication. EWS messages and data should always be sent in the same agreed-upon and useful form and language. Messages need to be verified and repeated across times and systems to ensure they reach the appropriate receptors.

Communication of EWS information demands clarity. The content of messages must be concise and effective. Warnings must include elements on hazard type, severity, probability, location, time scale and instructions for action. Communications can be in many forms, from verbal and non-verbal, but must consider culture, language, and context.

To enable the community as first responders during disasters, Community Based Action Team (CBAT) facilitates the community in establishing resource mobilization scenarios relevant to the type of hazard in their environment – Indonesian Red Cross

** Failures in considering social, political, economic and physical contexts*

When EWS are implemented without consideration of the context, they often result in failure or limited effectiveness or lack of sustainability. EWS demand sustained political, economic and social commitment. Without this, there can be a failure of:

- coordination of responsibilities,
- legal frameworks or institutionalized EWS components,

- adherence to agreed-upon standards or shortage of political will at national or local levels to support DRR and EWS efforts.

Through emergency drill, Community Based Action Team (CBAT) has practiced how to evacuate disaster victims – Indonesian Red Cross

Political commitment is also required to extend across political boundaries, through international agreements as well as recognition of shared risks and resources. Without this commitment in the short term (for example, in regards to sharing information on the opening of dams) and long term (planning resource use, preparing for climate change and sharing data and information on hazard trends), the vulnerabilities of one country can extend to another.

EWS need to consider the context of broader activities and processes which affect their success. Without an understanding of the context of natural resource use, climate change, urbanization, migration, and industrialization, for example, EWS are limited in the scale and duration of their effectiveness. Other real-time processes that EWS have sometimes failed to include are the movement of populations with EWS responsibilities (such as volunteers who have to travel for their livelihoods), the turnover of volunteers without the transfer of knowledge, a lack of appointment of new staff in the event that those with responsibilities are unavailable (due to sickness or holidays), or preparing for disasters to strike at any time of the day, from early morning to the middle of the night.

Failing to consider social processes also leads to some areas and populations being marginalized from EWS efforts. In South East Asia, communities can be located in diverse landscapes, from dense urban informal settlements to challenging rural areas. They may be comprised of indigenous populations with unique languages and cultural needs. Such communities may not be 'linked in' to local level dialogues or communication networks, and sometimes are even left out of national level planning due to challenges posed by accessibility.

** Failures in considering risks of multiple hazards and time- scales*

EWS need to be designed with hazard risk knowledge. If a region is vulnerable to multiple forms of hazards, as most communities and countries in South East Asia are, it requires national and community-based EWS which are multi-hazard and operate across diverse time scales. EWS will fail when they do not reflect the correct type, frequency and severity of hazards. Without correct data and supporting commitments for long-term forecasting, systems can fail or provide incorrect risk profiles. EWS which do not reflect the need for different hazards to have diverse methods of forecasting (different durations for monitoring and warnings) will also not be effective in producing information that can be used to protect vulnerable communities.

Section 8: Stories from the National Societies

NSs should be encouraged to share more knowledge and experiences relating to EWS on a national level, and also across the region. It is important that NSs share not only replicable actions, but also lessons learned on what barriers have been met and how they might be overcome. Stories presented here are meant to draw attention to current EWS programming and experiences from across the region. They are not to be considered exhaustive, but meant to be used as starting points for the sharing of information between NSs.

Viet Nam

Though on different time scales, and with different regions having various levels and types of risk, Viet Nam is vulnerable to many types of hazards. Different portions of the country are exposed to flooding, drought, fires, cyclones and landslides. EWS are coordinated and supervised by the Central Committee for Flood and Storm Control (CCFSC), which has parallel structures from the Ministerial to the Commune level. The CCFSC is responsible for all levels of warning systems, from the dissemination of information on forecasts to raise the awareness levels of communities on disaster risk.

Viet Nam is considered a 'notable exception' in countries which are pursing DRR, in that it includes risk reduction, including EWS efforts in its development and poverty reduction agendas and strategies (DFID 2005). Though the CCFSC is already undertaking effective EWS programming, more assistance is needed to ensure that Viet Nam's warning systems fully cover variations in the nation's types of risks over its diverse landscapes. EWS also need to be prepared to function in times of increased hazard severity and diversity, as Viet Nam is particularly vulnerable to climate change.

The Thai Red Cross stimulates community people to actively participate in an tsunami evacuation drill – the Thai Red Cross

Cambodia

Vulnerable to flooding, drought and insect infestations, Cambodia has a risk profile covering multiple hazards. The geographic variability of these hazards is spread over both rural and urban landscapes, and is partially driven by the presence of large, cross-border watersheds throughout the country. Cambodia has been identified as being vulnerable to climate change, and unsustainable resource use is further driving variations in risks to hazards.

EWS in Cambodia face a number of challenges, including their need to focus on multiple forms of hazards,

cross-border issues, and be sustainable through handovers from various levels of actors. While Cambodia now has a National Committee for Disaster Management (NCDM) which, in cooperation with other actors, has created and is currently implementing a Strategic National Action Plan (SNAP) for DRR, the country is still facing challenges on a lack of clarified guidelines for DRR, both on a political and technical level. For EWS to become more effective and reach all provinces and communities at risk, Cambodia needs a clarification of roles and responsibilities of stakeholders and organizations, an increase in knowledge and physical resources, and strong cross-border linkages and coordination of efforts.

Focus on EWS Processes in Cambodia

Based on a cooperation agreement between the Mekong River Commission (MRC) and the NCDM, the Cambodia Red Cross (CRC) undertook a project on implementing flood and early warning dissemination activities in 20 Cambodian villages, entitled "Provision of Flood Early Warning to Flood-Vulnerable Communities in the Lower Mekong Basin". This initiative was founded on three objectives: (1) implementing EWS in each village; (2) enhancing the capacity of both the NCDM and CRC in disseminating flood information; and (3) the maintaining of EWS activities in each selected village. The project was handed over formally to the NCDM at the completion of its cycle, leaving responsibilities relating to EWS on the NCDM and MRC, with the CRC recognized as a partner in some activities (particularly information dissemination at the community level).

Cambodia's SNAP recognizes that the development of multi-hazard EWS is the responsibility of the MRC, complimented by community-based projects of CRC, the American Red Cross, and other relevant NGOs. The MRC has agreed to establish a Regional Flood Centre, undertake structural measures for reducing risk, identify how land management influences risk levels, issue daily flood forecasts and warnings, and strengthen the capacity of the Ministry of Water Resources and Meteorology (MOWRAM) to collect and disseminate data.

Care is needed to ensure that current plans for EWS consider hazard vulnerability beyond flooding, including drought and insect infestation. There is also a need to scale across current warning systems to include all provinces and at-risk villages in Cambodia, particularly in traditionally marginalized locations such as the highlands and border regions of Vietnam and Laos.

The initial EWS project of the NCDM and CRC focused on two-way communication networks, which stretched from the national to the village level and fed back, enabled communities to be more effective partners in their own risk reduction. Communities were able to play a role not only in updating information on risk (i.e. through changing records of flood levels on billboards), but also in feeding information back on conditions to the NCDM. The CRC played an instrumental role in creating and supporting these two-way systems.

Established institutionalized linkages between the CRC and NCDM are a strong example of the potential for DRR efforts in Cambodia. The mobilization of formal support between NGOs, government links, and the CRC has resulted in arrangements that have the potential to be sustained over time, and expanded into new provinces. However, EWS systems in Cambodia are now only one-way, or top-down, due to a lack of sustainable capacity and resources to be offered to at-risk communities. In spite of the success of the NCDM and MRC's pilot project in 40 villages, new commitments are necessary to continue the momentum of established systems, and scale up and across capacities.

Cambodia is also vulnerable to climate change, with communities already expressing concern over variances in rain, drought and flooding patterns. Neighboring countries will also experience changes in risk due to climate change, therefore joint management of watersheds and EWS must consider these shifts to be effective.

The involvement of RCVs in EWS, particularly in gathering and disseminating data, is a strong asset to broader warning and DRR systems, and has been strongly harnessed in Cambodia. The volunteers serve as links to provincial and national-level dialogues, and can be trained in techniques relevant to the four elements of EWS, such as hazard mapping, observing water levels and assisting in evacuations. The CRC can increase the sustainability of their involvement in EWS through providing further support to RCVs in the form of training and resources. The NS can also promote efforts to partner with, and support the work of other organizations, moving away from difficult competitive humanitarian landscapes to promote cooperative and sustainable efforts, such as the NCDM and ADPC's DRR Forums.

Flood emergency operation in Jakarta 2007 – Indonesian Red Cross

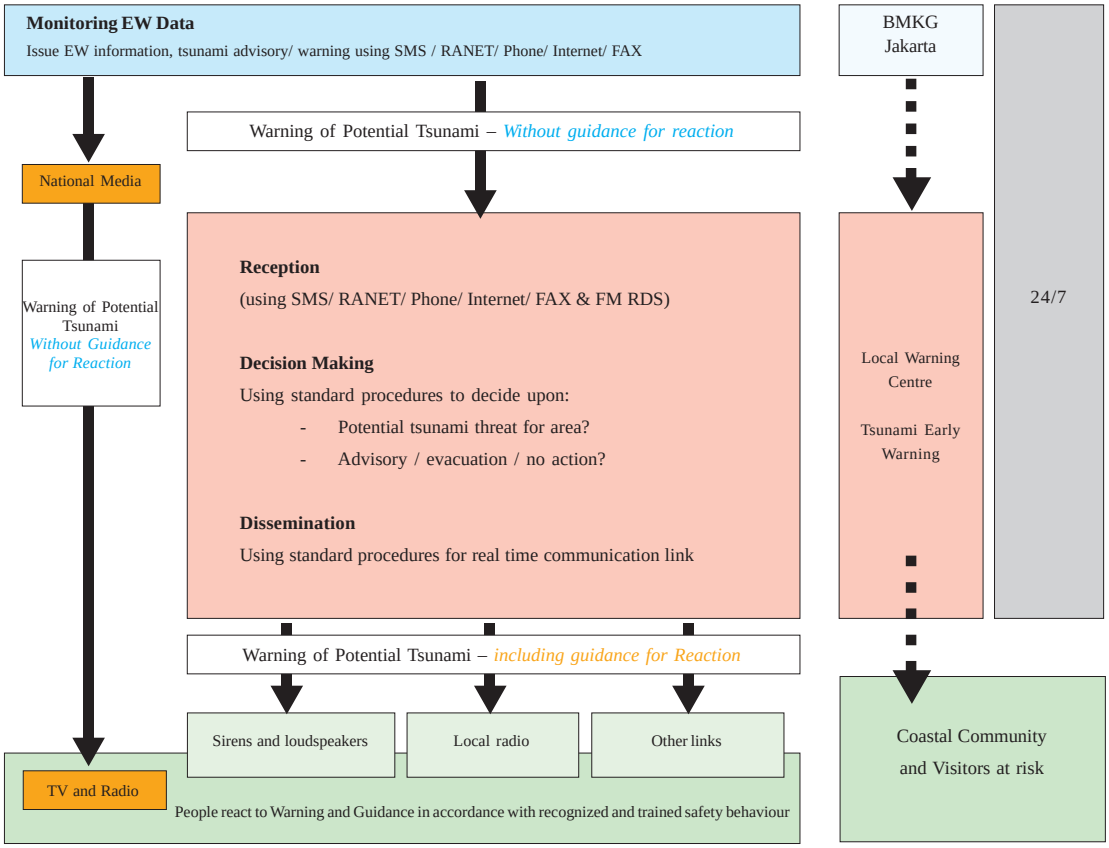


Figure 5: *Example of Flow of EWS for Tsunami in Indonesia (GTZ 2009)*

Indonesia

Indonesia is vulnerable to multiple hazards on diverse time scales. El Nino, a warming event in the eastern equatorial Pacific Ocean that occurs about every 2-7 years, can generally be predicted months in advance and is known to greatly impact the country. This event typically causes drought conditions throughout the country, which also enhance fire outbreaks and haze. The risk profile of Indonesia is broad, also including tsunamis, flooding, insect infestations, earthquakes, volcanic activity and threats driven by climate change. Indonesia already has a strong national EWS, with support from the international community and coordinated efforts of multiple ministries and organizations, including the Indonesian Red Cross (known as PMI, or Palang Merah Indonesia).

Still, the effectiveness of EWS is being increased through new efforts focusing on community EWS involvement and mobilization. Flows of information and action relating to particular hazards can be complex, with multiple state and non-state players involved, and diverse groups of communities receiving end messages (see the example of the flow of EWS for tsunamis in Indonesia, outlined in Figure 5). There is a need to further ensure that messages are transmitted in appropriate languages and with clear content, and that responsibilities of the multiple involved organizations and other actors are clarified and agreed upon, particularly regarding the dissemination of information to and from communities.

Focus on EWS Processes in Indonesia

The PMI is currently reviewing its role in EWS processes, to identify ways in which their actions can be strengthened and diversified at the national, chapter, branch and community levels. The PMI is a core member of the coordinating body for EWS in Indonesia, but the roles that it plays (disseminating information to communities) are shared with other organizations. The NS, however, can play a unique role in ensuring that communities are undertaking broader community-based disaster risk reduction programming (CBDRR), and that EWS are an important, but not limited, component of local-level risk reduction activities. PMI, with its unique community-embedded knowledge, has the potential to share information on indigenous and local level activities which other organizations might not have the experience to identify as important, such as indigenous or traditional ways to disseminate risk information.

The PMI now functions as an organization which can oversee the translating and analyzing of forecasting and information for EWS, play a role in sending messages to communities in ways which are accessible, immediate, coherent, and official, and continue to mobilize communities to respond in ways suited for their own capacity. The NS is currently engaging in dialogues on identifying ways to make their work more effective. At the national level, PMI is identifying ways to manage knowledge and built resources, from simplify monitoring processes to identifying which tools and hardware are necessary to disseminate information from national to chapter and branch levels. Also being discussed are ways to clarify various roles and responsibilities relating to different stages of warning processes, clarify and agree upon language to be used in different situations, identifying chains of notification in the event of an emergency, and longer term considerations, such as who is responsible for the maintaining of equipment.

Chapter and branch level dialogues involve similar discussions, but also include considerations of roles in monitoring disasters at local levels, identifying focal points and finding ways to enter into agreements with local government and authority groups for warning dissemination in selected geographical regions. Other considerations for local level PMI involvement are who gathers feedback from communities, who is responsible to liaise with the PMI at various other levels, and who is responsible for training in relation to EWS roles. Specific dialogues at the community level extend to considerations of how to carry out local capacity and risk assessments, the creation of evacuation plans, hazard mapping and the building of necessary infrastructure. The PMI has made CBDRR activities a priority, and is working on reinforcing community capacity and identifying ways in which EWS can be made more effective at the local level.

Laos

Laos is vulnerable to a diverse set of hazards, including flooding, drought and landslides. The NDMC is the governing body for disaster management, operating through the work of the

Saving the vulnerable people during flood emergency operation in Jakarta 2007 – Indonesian Red Cross

National Disaster Management Office (NDMO) and serving as the agency in charge of the creation and implementation of the National Disaster Management Plan. The Plan includes a strong focus on community-based EWS and recognizes the need for effective EWS. It recognizes the government as the main force being warning systems, but further planning and programming on EWS is still being developed.

Challenges to the development of EWS for Laos include a low capacity on a national level for the dissemination of information and the demand for systems which cover multiple hazards at diverse time scales. Important recommended considerations for EWS in Laos include the recognition of indigenous and traditional warning systems, shifts in risk due to changes in climate, and cross-border resource and risk information management.

Timor Leste

Timor Leste is prone to various hazards. Annual heavy rains cause landslides and flash flooding, and the country is also at risk of earthquakes, insect infestations, diseases (affecting both humans and animals), tsunamis, cyclones, coastal flooding and, during dry seasons and El Nino-driven conditions, drought and fires. The National Disaster Risk Management Plan (NDRMP) of the NDMO includes considerations relating to EWS, but notes that Timor Leste has traditionally dealt with disasters in a reactive manner.

Assistance is necessary to help the country strengthen risk reduction strategies, including warning systems. Particular focus should be paid to ensure that EWS are developed for both short term hazards such as annual flash flooding and those driven by conditions changing every two to three years or exacerbated by climate change.

HFA Priorities for Action	RC Movement Roles	Examples of corresponding EWS activities
Disaster risk reduction is a national & local priority with a strong institutional basis	Advocate to include DRR in national development plans	Promote EWS as a core component of DRR, and ensure that the system is included in all levels of national planning, from risk assessment to local risk educational activities
	Advocate for, and play role in, national platforms	Promote the inclusion of EWS elements in national platforms, including the clear and agreed-upon roles that other actors will take (including NSs and RCVs) to support government EWS activities
	Support community based initiatives/programmes through local RC network	Use local RC staff and RVCs to promote and maintain community-based EWS and two-way systems
Identify, assess & monitor disaster risks & enhance early warning	Contribute to monitoring disaster data locally & globally	Collect data in partnership with government authorities and other appointed actors, to feed into EWS forecasting and monitoring Focus on collecting data on the local level, through staff and RCVs
	Assist in national level risk assessments	Assist in VCAs or other vulnerability and risk assessments at the community level, highlighting at-risk areas that may be previously marginalized due to lack of access or unique populations (i.e. Indigenous or migratory) Feed new and traditional local information up into provincial and national-level risk assessments
	Implement hazard, vulnerability & capacity assessment at local level	Assist in VCAs or other vulnerability and risk assessments at the community level, highlighting at-risk areas that may be previously marginalized due to lack of access or unique populations (i.e. Indigenous or migratory) Promote the implementation and maintenance of community-based EWS
	Facilitate local level multi-hazard early warning	Train and steer RCVs and NS staff to participate in and facilitate all stages of EWS activities within communities, from supporting government agencies in monitoring risk, to assisting with alerts and response efforts Promote the feeding up of information on risk and resilience to district, provincial, and national-level dialogues on EWS to ensure that local needs and knowledge are recognized
Use knowledge, innovation & education to build culture of safety & resilience	Support local level awareness raising through RC youth, schools & volunteers	Promote RCVs and NS staff to raise awareness on EWS, particularly on systems being more than alerts, through formal and informal training and educational programs on EWS at the community level
	Share good practice locally & globally	Use RCVs within communities and NS staff to gather examples on best practices with EWS Feed information on best practices to EWS dialogues on district and national levels, highlighting specific examples of where EWS have met both challenges and success at the local level
	Engage in national, regional and global policy forums	Ensure that EWS actors, from other organizations to government authorities, know that the NS is interested in participating in national, regional and global forums on EWS Promote the participation of RCVs and NS EWS practitioners in relevant national forums and networks, so that they are recognized partners in EWS implementation and monitoring
	Partner with UN, INGOs, governments & civil society	Ensure that all EWS involvement occurs in a cooperative manner with other actors, including governments, partner NGOs and PNSs, and civil society by participating in relevant networks and dialogues Institutionalize the responsibilities of the NS and RCVs by having these commitments recognized in relevant national-level networks, partnerships, policy and action plans, both on EWS and DRR
Reduce the underlying risk factors	Support non-structural small-scale risk reduction projects	Advocate for communities to receive assistance in the form of training and sponsorship to support the creation of small-scale risk reduction projects, including EWS components Assist in the promotion of community-based EWS, with components of risk reduction as part of the system Conduct local workshops on ways in which resource use can impact on vulnerability levels, and ways in which communities can change their risk levels through small-scale (household or community level) projects
Strengthen disaster preparedness for effective response at all levels	Build preparedness for response capacity at local level with national, regional & global support	Ensure that national-level EWS include mechanisms for two-way feedback from communities Ensure that national-level EWS risk profiles reflect the vulnerabilities of all communities, including those traditionally marginalized (i.e. Migratory or indigenous) Promote the use of community-based EWS which feed into national-level EWS Advocate for the continued monitoring and updating of risk profiles from communities to district, provincial and national levels to ensure that changes are reflected in a timely way

Figure 6: *Relationships between EWS and HFA priorities*

Section 9: National Societies, the HFA, and EWS

The Hyogo Framework for Action is a core starting point for activities in DRR and EWS. The RC Movement's role in the implementation of its Priorities for Action is diverse. As such, there are numerous activities that can be undertaken by NSs and RCVs to support the Priorities.

This section outlines, in relation to each HFA Priority, what corresponding EWS activities the NS and RCVs can pursue. Each activity has aspects that can be undertaken at a national or local level, and feeds into other programming on sustainable development and DRR. These activities can be used as starting points for discussions for each NS to identify opportunities suitable to their unique sets of resources and responsibilities in relation to EWS and the implementation of national DRR action plans in their own country.

Section 10: Taking it Forward – Suggestions based on core findings

1. Institutions and actors holding roles and responsibilities in EWS processes, including NSs and RCVs, need to ensure that their involvement is coordinated and sustainable, in order to avoid duplicity and gaps in the flow of information and engagement
2. NSs can undertake advocacy and awareness raising activities, which are often under-looked but are core to success of EWS at the community level
3. At all levels, NSs can facilitate and support training and educational activities for EWS

Tsunami evacuation simulation in schools – the Thai Red Cross

4. NSs can participate in or undertake evaluations on the state of EWS at the community level, to ensure that activities are monitored and upgraded where necessary
5. NSs should perceive EWS as part of the DRR cycle, and as such, support efforts to ensure that EWS are incorporated into national-level policies and legislation, as well as broader DRR NS programming
6. NSs should encourage the understanding that EWS themselves are systems by nature, therefore components should not be limited to hazard detection and alerts, but be part of broader DRR efforts, including education and advocacy activities
7. The monitoring and evaluation of EWS activities and the quality of community participation are often overlooked steps, but are core to developing sustainable local-level confidence and involvement in DRR efforts
8. NSs can promote the creation of EWS which are flexible to changes in risk levels, including those driven by climate change

The Fundamental Principles of the International Red Cross and Red Crescent Movement

Humanity

The International Red Cross and Red Crescent Movement, born of a desire to bring assistance without discrimination to the wounded on the battlefield, endeavours, in its international and national capacity, to prevent and alleviate human suffering wherever it may be found. Its purpose is to protect life and health and to ensure

respect for the human being. It promotes mutual understanding, friendship, cooperation and lasting peace amongst all peoples.

Impartiality

It makes no discrimination as to nationality, race, religious beliefs, class or political opinions. It endeavours to relieve the suffering of individuals, being guided solely by their needs, and to give priority to the most urgent cases of distress.

Neutrality

In order to enjoy the confidence of all, the Movement may not take sides in hostilities or engage at any time in controversies of a political, racial, religious or ideological nature.

Independence

The Movement is independent. The National Societies, while auxiliaries in the humanitarian services of their governments and subject to the laws of their respective countries, must always maintain their autonomy so that they may be able at all times to act in accordance with the principles of the Movement.

Voluntary service

It is a voluntary relief movement not prompted in any manner by desire for gain.

Unity

There can be only one Red Cross or Red Crescent Society in any one country. It must be open to all. It must carry on its humanitarian work throughout its territory.

Universality

The International Red Cross and Red Crescent Movement, in which all societies have equal status and share equal responsibilities and duties in helping each other, is worldwide

Our world is in a mess.
It's time to make your move.

ourworld-yourmove.org

The *International Federation of Red Cross and Red Crescent Societies* promotes the humanitarian activities of National Societies among vulnerable people.

By coordinating international disaster relief and encouraging development support it seeks to prevent and alleviate human suffering.

The International Federation, the National Societies and the International Committee of the Red Cross together constitute the International Red Cross and Red Crescent Movement.

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