



EWC III

Third International Conference on Early Warning

From concept to action

27-29 March 2006
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Developing Early Warning Systems: A Key Checklist

WORKING DRAFT



Federal Foreign Office

FOREWORD

Early warning is a major element of disaster risk reduction. It prevents loss of life and reduces the economic and material impact of disasters. To be effective, early warning systems need to actively involve the communities at risk, facilitate public education and awareness of risks, effectively disseminate messages and warnings and ensure there is constant state of preparedness.

In January 2005, the World Conference on Disaster Reduction adopted the “Hyogo Framework for Action 2005-2015: Building the Resilience of Nations and Communities to Disasters”. This included clear references to the importance of early warning, and encouraged the development of *“early warning systems that are people centred, in particular systems whose warnings are timely and understandable to those at risk (...) including guidance on how to act upon warnings (...)”* (para. 17, ii.d.9).

The Third International Conference on Early Warning (EWC III) provides the opportunity to discuss hazards and risks around the world, and ways to minimize the impacts of these events, through the presentation of specific projects. The objective of this approach is to contribute to the translation of early warning concepts into action. A key outcome of the conference is the compilation of an early warning checklist of key actions for communities and practitioners, as recommended by the Hyogo Framework for Action.

This document is a draft submitted to EWC III, to be developed and refined during the 3-day forum that will take place in Bonn from 27 to 29 March 2006. It has been prepared ahead of the conference as a basis for discussion and to benefit from the good practices and practical examples that will emerge via the presentation of early warning projects throughout the conference. The result of those exchanges should be a checklist of actions, illustrated by good practice where appropriate, to assist countries and communities in developing effective, people-centred early warning systems. The document is structured around the four elements that make up an early warning system, with additional considerations of cross-cutting issues and key actors involved.

This paper aims at being a simple checklist of key elements and actions that national governments or community organizations can refer to when developing new early warning systems, evaluating existing arrangements or simply checking that crucial procedures are in place. A selection of practical examples and case studies, drawn from the conference where possible, will complement the document to illustrate key points. The checklist is not intended to be a comprehensive design manual, but instead a practical, non-technical reference tool to ensure that the major elements of a good early warning system are in place.

This draft Checklist was prepared by the secretariat of the Third Early Warning Conference. The writers received significant substantive input from organizations involved in early warning and disaster risk reduction, in the United Nations international system and beyond, including from the secretariat of the International Strategy for Disaster Reduction (ISDR) and its Platform for the Promotion of Early Warning (PPEW), as well as from the German government and within the German disaster reduction community.

Appreciation and thanks are extended to all contributors to this collective exercise.

WHAT'S INSIDE

This document is intended to be a short, simple checklist of key elements, actions and good practices which national governments or community organizations can refer to when developing new early warning systems or evaluating existing arrangements. Practical examples and case studies, drawn from both the Third International Conference on Early Warning and broader community practice, will be used throughout the document to further illustrate key points.

The checklist is intended to be a non-technical reference tool rather than a comprehensive or exhaustive 'how to' list for the design of early warning systems.

How to Use the Checklist

The document is broken into two inter-related parts that should be read in order. The first section provides useful background information and overarching issues important to early warning, while the second part is a practical checklist of key actions that should be considered when developing an early warning system.

1. Key elements of early warning, cross-cutting issues and key actors involved in early warning

A brief section on the four key elements of early warning: risk knowledge; technical monitoring and warning service; communication and dissemination of warnings; and community response capability is included to emphasize the major components that comprise an effective people-centred early warning system, and why each is important.

In addition to the four elements of early warning, a number of cross-cutting issues that are critical to the development and sustainability of effective early warning systems have also been outlined. These include effective governance and institutional arrangements, a multi-hazard approach, involvement of local communities and consideration of gender perspective and cultural diversity.

An explanation of key actors involved in early warning activities, and their roles and responsibilities is included to provide some context and further background to the list of key actors which is presented in each section of the checklist.

2. A checklist of practical actions to assist in developing, evaluating or refining an early warning system

For ease of use and practicality, an individual checklist has been developed for each of the four elements of early warning. An additional checklist has also been prepared on the cross-cutting issue of governance and institutional arrangements due to its critical importance to the strengthening and sustainability of effective early warning systems.

Each of the checklists is grouped under key headings or themes and includes a simple list of actions or steps that, if followed, will provide a solid basis upon which to build or evaluate an early warning system. This list is designed as a starting point only and is not intended to be an exhaustive list of all steps involved in developing a comprehensive early warning system

A list of some of the key actors who should be consulted and involved in developing each element of early warning system is also included.

Practical Examples

To illustrate the items included in the checklist, examples of good practices, useful tips or lessons learnt will be added to the checklist following conclusion of the conference.

PEOPLE-CENTRED EARLY WARNING SYSTEMS

1. The Key Elements

The objective of people-centred early warning systems is to empower individuals and communities threatened by hazards to act in sufficient time and in an appropriate manner so as to reduce the possibility of personal injury, loss of life and damage to property and the environment.

A complete and effective early warning system comprises four inter-related elements, spanning knowledge of hazards and vulnerabilities through to preparedness and capacity to respond. A weakness or failure in any one part could result in failure of the whole system.

Best practice early warning systems also have strong inter-linkages between all of the elements, which are underpinned by communication and effective governance and institutional arrangements. The major players concerned with the different elements should meet regularly to ensure they understand all of the other components and what other parties need from them.

➤ Risk Knowledge

Risks arise from the combination of the hazards and the vulnerabilities to hazards that are present at a particular location or region. Assessments of risk require systematic collection and analysis of data and should take into account the dynamic and variability of hazards and vulnerabilities that arise from processes such as urbanization, rural land-use change, environmental degradation and climate change. Risk assessments and maps help to motivate people, prioritise early warning system needs and guide preparations for response and disaster prevention activities.

➤ Monitoring and Warning Service

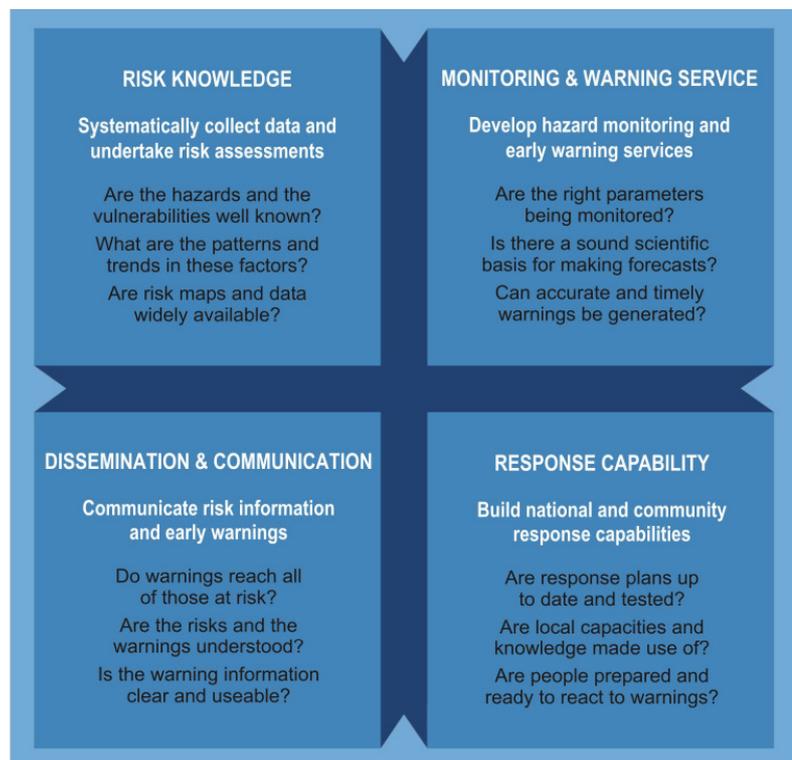
Warning services lie at the core of the system. They must have a sound scientific basis for predicting and forecasting and must reliably operate 24 hours a day. Continuous monitoring of hazard parameters and precursors is necessary to generate accurate warnings in a timely fashion. Warning services for the different hazards should be coordinated where possible to gain the benefit of shared institutional, procedural and communication networks.

➤ Dissemination and Communication

The warnings must get to those at risk. For people to understand the warnings, they must contain clear, useful information that enables proper responses. Regional, national and community level communication channels and tools must be pre-identified and one authoritative voice established. The use of multiple communication channels is necessary to ensure everyone is reached and avoid failure of any one channel, as well as to reinforce the warning message.

➤ Response Capability

It is essential that communities understand their risks; they must also respect the warning service and should know how to react. This requires systematic education and preparedness programmes led by disaster management authorities. It is essential that disaster management plans are in place and are well practiced and tested and that the community is well informed on options for safe behaviour and escape and on means to avoid damage and loss to property.



2. Cross-cutting Issues

There are a number of overarching, cross-cutting issues that are applicable to early warning systems as a whole, in addition to the needs of the individual elements of the early warning system. These issues need to be taken account of in the design and maintenance of early warning systems in order to ensure overall effectiveness and sustainability.

➤ **Effective Governance and Institutional Arrangements**

Well-developed governance and institutional arrangements support the successful development and sustainability of effective early warning systems. It is the foundation upon which the previously outlined four elements of early warning are built, strengthened and maintained.

Good governance is encouraged by robust legal and regulatory frameworks and supported by sustained political commitment and integrated institutional arrangements. A systematic approach to relate local decision-making and participation with broader administrative and resource capabilities at the national or regional level is essential.

Information flows and coordination mechanisms need to be streamlined to ensure efficient vertical and horizontal linkages across all stakeholders involved in early warning systems.

➤ **A Multi-Hazard Approach**

Where possible, early warning systems should seek linkages among the different hazard-based systems. Economies of scale, sustainability and efficiency can be enhanced if systems and operational activities are set up within a multi-hazard, multi-purpose framework that considers all hazards and end user needs.

By covering several hazards, multi-hazard early warning systems will be activated more often than any single-hazard warning system, and therefore should provide better functionality and reliability for dangerous high intensity events such as tsunamis that occur infrequently. They also can help the public to understand the range of risks they face and can reinforce desired preparedness actions and warning response behaviours.

➤ **Involvement of Local Communities**

People-centred early warning systems rely on the direct participation of those most likely to be exposed to hazards. Without the involvement of communities and individuals at risk, government and institutional interventions often prove to be inadequate when events occur. The public may not understand or appreciate an official system, and there is the risk that systems will mainly cater to cities and the most densely populated areas.

A local approach to early warning and the participation of local communities enables a multi-dimensional response to problems and needs. In this way, local communities, civic groups and traditional structures can engage and contribute to the reduction of vulnerability and to strengthening of local capacities.

➤ **Consideration of Gender Perspective and Cultural Diversity**

In developing early warning systems it is essential to recognize that different groups have different vulnerabilities according to cultural, gender or other characteristics that influence their capacity to effectively prepare, prevent, mitigate or respond to disasters. Women and men often play different roles in society and have different concerns and information in disaster situations. In addition, the elderly, disabled and socio-economically disadvantaged are often highly vulnerable.

Information, institutional arrangements and warning communication systems should be tailored to meet the needs of every group and every community.

“Countries that develop policy legislative and institutional frameworks for disaster risk reduction and that are able to develop and track progress through specific and measurable indicators have greater capacity to manage risks and to achieve widespread consensus for, engagement in, and compliance with disaster risk reduction measures across all sectors of society.”

Hyogo Framework for Action, Paragraph 16.

3. Key Actors

Developing and implementing an effective early warning system requires the contribution and coordination of a wide range of individuals and groups throughout the community. Each has a set of overlapping functions for which it should be responsible and accountable for.

Communities, particularly those most vulnerable, are central to people-centred early warning systems. Their input to system design and their ability to respond ultimately determines the extent of risk associated with natural hazards. They should be aware of the hazards and the related effects to which they are exposed and be able to take specific actions to minimize the threat of loss or damage.

Local governments should have considerable knowledge of the hazards to which their communities are exposed. They must be actively involved in the design and maintenance of early warning systems, and understand advisory information received to be able to advise, instruct or engage the local population in a manner that increases their safety and reduces the possible loss of resources on which the community depends.

National governments are responsible for policies and frameworks that facilitate early warning, in addition to the technical systems for the preparation and issuance of hazard warnings for their country in a timely and effective manner. They should ensure that warnings and related responses are directed towards the most vulnerable populations. The provision of support to local communities and local governments to develop operational capabilities is an essential function to translate early warning knowledge into risk reduction practices.

Regional institutions and organizations should provide specialized knowledge and advice in support of national efforts to develop or sustain operational capabilities experienced by countries that share a common geographical environment. Regional organizations are crucial to linking international capabilities to the particular needs of individual countries and in facilitating effective early warning practices among adjacent countries.

International bodies should provide support for national early warning activities and foster the exchange of data and knowledge between individual countries. Support may include the provision of advisory information, technical assistance, and policy and organizational support necessary to ensure the development and operational capabilities of national authorities or agencies responsible for early warning practice.

Non-governmental organisations play a critical role in raising awareness among individuals and organizations involved in early warning and in the implementation of early warning systems, particularly at the community level. In addition, they play an important advocacy role to help ensure that early warning stays on the agenda of government policy makers.

The private sector has a diverse role to play in early warning, including developing early warning capabilities in their own organizations. The media plays an important role in improving the disaster consciousness of the general population and disseminating early warnings. In addition, the private sector has a large untapped potential to help provide skilled services in form of technical manpower, know-how or donations (in-kind and cash) of goods or services, especially for the communication, dissemination and response elements of early warning.

The science community has a critical role in providing specialized scientific and technical input to assist governments and communities in developing early warning systems. Their expertise is critical to analysing natural hazard risks facing communities, supporting the design of scientific and systematic monitoring and warning services, supporting data exchange, translating scientific or technical information to comprehensible messages, and to the dissemination of understandable warnings to those at risk.

“Much has been learnt from the creative disaster prevention efforts of poor communities in developing countries. Prevention policy is too important to be left to governments and international agencies alone. To succeed, it must also engage civil society, the private sector and the media.”

Kofi Annan
UN Secretary-General
International Decade for Natural Disaster Reduction (IDNDR) Programme Forum
Geneva, July 1999

Key Element 1:

RISK KNOWLEDGE

Aim: Establish a systematic, standardized process to collect and assess data, maps and trends on hazards and vulnerability.

Key Actors

International, national and local disaster management agencies; meteorological and hydrological organizations; geophysical experts; social scientists; engineers; land use & urban planners; researchers and academics; organizations and community representatives involved in front-line disaster management; international and UN agencies such as WMO, UNISDR, UNEP, UNOSAT.

Checklist

1. Organizational Arrangements Established

- Responsibility for coordinating hazard identification, vulnerability and risk assessment across the country assigned to one national organization or entity.
- Key national government agencies involved in the hazard and vulnerability assessment process identified and roles clarified (e.g. agencies responsible for economic data, demographic data, land use planning, social data etc).
- Legislation or government policy in place mandating the preparation of hazard and vulnerability maps for all communities.
- National standard developed for the systematic collection, sharing and assessment of hazard and vulnerability data, standardized with neighbouring or regional countries where required.
- International organizations or technical experts contacted for assistance where knowledge gaps identified.
- Process developed for scientific and technical experts to assess and review the accuracy of risk data and information.
- Strategy developed to engage local communities in hazard and vulnerability analyses.
- Process established to review and update risk data each year, and to include information on any new or emerging vulnerabilities and hazards, including the likely impacts of climate change.
- On-going consultation with international agencies and national technical experts regarding the latest state of knowledge on future or potential hazards.

2. Natural Hazards Identified

- Characteristics analysed of natural hazards affecting the country (e.g. intensity, frequency and probability), including analysis of historical data.
- Hazard maps developed for all communities across the country to identify the geographical areas and communities that could be affected by natural hazards.
- An integrated hazard map developed, where possible, to assess the interaction of multiple natural hazards.

3. Community Vulnerability Analysed

- Community vulnerability assessments conducted for all relevant natural hazards.
- Both historical data sources and potential future hazard events considered in vulnerability assessments.
- Factors such as gender, disability, access to infrastructure, economic diversity and environmental sensitivities considered.
- Vulnerabilities documented and mapped (e.g. people or communities along coastlines identified).

4. Risks Assessed

- The interaction of hazards and vulnerabilities assessed to determine the overall risks faced by each region or community.
- Community and industry consultation conducted to ensure risk information is comprehensive and includes historical and indigenous knowledge; and local and national level data.
- Activities that increase risks identified and evaluated.
- Results of risks assessment integrated into local risk management plans and hazard warning messages issued.

5. Information Stored and Accessible

- Central 'library' or GIS database established to store all disaster and natural hazard risk information.
- Hazard and vulnerability data freely available to government and the public.
- Public information guide developed and available to help raise public awareness of natural hazard risks.
- Maintenance plan developed to keep data current and updated.

Key Element 2:

MONITORING AND WARNING SERVICE

Aim: *Establish an effective hazard monitoring and warning service with a sound scientific and technological basis.*

Key Actors

National meteorological and hydrological service; water management authority; volcanic observatory; geophysical institute; tsunami warning centre; climate and agricultural drought centre; university; research institute; private sector equipment suppliers; telecommunications authority; quality management expert; regional technical centres for drought; water or meteorology; UN agencies such as WMO, FAO, UNESCO, UNEP, UNOSAT.

Checklist

1. Institutional Mechanisms Established

- Authority to issue warnings vested in one organization (operational at all times) and mandated by law.
- Roles and responsibilities of agencies generating and issuing warnings clearly defined.
- Agreements established to ensure consistency of warning language and communication channels where different hazards are handled by different agencies, and to define interagency responsibilities.
- An all-hazard plan to obtain mutual efficiencies and effectiveness among different warning systems established.
- Warning system partners, including local authorities, know which organizations are responsible for warnings.
- Protocols in place to define communication responsibilities and channels for technical warning services.
- Communication arrangements with international and regional organizations agreed and operational.
- Regional agreements, coordination mechanisms and specialized centres in place for regional concerns such as tropical cyclones, floods in shared basins, data exchange, and technical capacity building.
- Warning system subjected to system-wide tests and exercises at least once each year.
- A national all-hazards committee on technical warning systems in place and linked to national disaster management and reduction authorities.
- System established to verify that warnings have reached the intended recipients.
- Warning centres staffed at all times (24 hours per day, seven days per week).

2. Monitoring Systems Developed

- For each relevant hazard, required parameters and measurement specifications documented.
- Plans for monitoring networks available and agreed with experts and relevant authorities.
- Equipment in place, including communications equipment, and personnel trained in its use and maintenance.
- Equipment and systems suited to local conditions and circumstances.
- Necessary data and analysis products from regional networks, adjacent territories and international sources accessible.
- Data received and processed in real time, or appropriate near-real time.
- Strategy in place for obtaining, reviewing and disseminating data on vulnerability-to-hazards factors.
- Data available in meaningful formats for relevant warning system partners, where possible in real time.
- Data routinely archived and accessible for verification and research purposes.

3. Forecasting and Warning Systems Established

- Data analysis, prediction and warning generation based on accepted scientific and technical methodologies.
- Data and warning products issued in accordance with international standards and protocols.
- Warning analysts educated and trained to appropriate international standards.
- Warning centres equipped with computer equipment needed to handle data and run prediction models.
- Fail-safe systems in place, such as power back-up, equipment redundancy and on-call personnel systems.
- Working linkages established between the operational warning system and the scientific research community.
- Warnings generated and passed on in an efficient and timely manner.
- Warnings provided in a form suitable to user needs (parameters, location, timing, etc).
- Quality management plan implemented to routinely monitor and evaluate operational processes including data quality and warning performance.

Key Element 3:

DISSEMINATION AND COMMUNICATION

Aim: *Develop communication and dissemination systems to ensure local, national and regional coordination & information exchange.*

Key Actors

International; national and local disaster management agencies; national meteorological and hydrological services; military and civil authorities; private organizations responsible for warning dissemination; businesses in vulnerable sectors (e.g. tourism, aged care facilities, marine vessels); media organizations (print, television, radio and on-line); organizations and community representatives involved in front-line disaster management; community-based and grassroots organizations, international and UN agencies such as UNISDR, IFRC, UNDP, UNESCO, UNEP, WMO, IFRC.

Checklist

1. Organizational and Decision-making Processes Institutionalised

- Warning dissemination hierarchy or chain of events enforced through government policy or legislation (e.g. message passed from government to emergency managers and communities etc).
- One decision maker or 'authoritative voice' assigned at the national level and one in each community.
- Functions, roles and responsibilities of each actor in the warning dissemination process specified in legislation or government policy (e.g. national meteorological and hydrological services, media, NGOs).
- Roles and responsibilities of regional early warning centres defined in the warning dissemination process.
- Volunteer network identified, trained and empowered to receive and widely disseminate hazard warnings to rural or remote households, particularly in disaster prone areas.
- Disseminating of warnings processed to neighbouring countries, using pre-established protocol and standards.

2. Effective Communication Systems and Equipment Installed

- Communication and dissemination systems that will best reach all people at risk identified (e.g. radio or television for those with access; and sirens, warning flags or messenger runners for remote communities).
- Communication and dissemination systems tailored to the needs of individual communities implemented.
- Warning communication technology reaches the entire population, including seasonal populations and remote locations.
- Trusted communicators or communication systems identified to disseminate warnings.
- International organizations or experts consulted to assist with identification and procurement of appropriate equipment.
- Multiple communication mediums used for warning dissemination (e.g. technical and non-technical, mass media and informal communication).
- Agreements developed to utilise private sector resources where appropriate (e.g. amateur radios, safety shelters)
- Consistent warning dissemination system used for all hazards.
- Communication system is two-way and interactive, allowing originators, disseminators and end-users to communicate and verify warnings have been received.
- Equipment maintenance and upgrade programme implemented.
- Equipment redundancies enforced so back-up systems are in place in the event of a failure.

3. Warning Messages Recognised and Understood

- Warning alerts and messages tailored to the specific needs of those at risk (e.g. messages need to be understood by groups of diverse cultural, social, gender, linguistic and educational backgrounds).
- Messages incorporate understanding of the values, concerns and interests of those who will need to take action and address these concerns in the warning (e.g. instructions for safeguarding livestock and pets).
- Warning alerts clearly recognisable and consistent across time and include follow-up actions when required.
- Warnings specific about the nature of the threat and its impacts.
- Mechanisms in place to inform the community when the threat has ended.
- Study into how people access and interpret early warning messages undertaken and lessons learnt incorporated into message formats and dissemination processes.

Key Element 4:

RESPONSE CAPABILITY

Aim: *Strengthen the ability of communities to respond to natural disasters through enhanced education of natural hazard risks, community participation and disaster preparedness.*

Key Actors

Community-based and grassroots organizations; schools; universities; informal education sector; media (print, radio, television, on-line); technical agencies with specialised knowledge of hazards; organizations and community representatives involved in front-line disaster management; international organizations involved in humanitarian affairs and disaster reduction; international; national and local disaster management agencies; regional disaster management agencies; international and UN agencies such as UNDP, UNEP, FAO, UNESCO, UNISDR, IFRC, WMO.

Checklist

1. Warnings Respected

- Warnings generated and distributed to those at risk by credible sources (e.g. government, spiritual leaders, respected community organizations) to enhance community response.
- Public perception of natural hazard risks and the warning service analysed to predict community responses.
- Strategies to build credibility and trust in warnings implemented (e.g. understanding difference between forecasts and warnings) in collaboration with technical agencies responsible for development of hazard warnings.
- False alarms minimised and improvements communicated to maintain trust in the warning system.

2. Disaster Preparedness and Response Plans Established

- Disaster preparedness and response plans empowered by law.
- Roles and responsibilities of actors involved disaster preparedness and response identified and coordination mechanisms in place.
- Disaster preparedness and response plans targeted to the needs of each vulnerable communities across the country.
- Hazard and vulnerability maps utilized to develop emergency preparedness and response plans.
- Up-to-date emergency preparedness and response plans developed, disseminated to the community, and practiced.
- Previous disaster events and the response analysed, and lessons learnt incorporated into disaster management plans.
- Strategies in place to maintain preparedness for recurrent hazard events.
- Regular tests and drills undertaken to test the effectiveness of the early warning dissemination process and response.

3. Community Response Capacity Assessed and Strengthened

- Community's ability to respond effectively to early warnings assessed.
- Response to previous disasters analysed and lessons learnt incorporated into future capacity building strategies.
- Community-based organizations engaged to assist with capacity building.
- Community and volunteer education and training programmes developed and implemented to bridge identified gaps.

4. Public Awareness and Education Enhanced

- Simple information on hazards, vulnerabilities, risks and why they occur, and how to reduce impacts disseminated to vulnerable communities and decision-makers.
- Community educated on how warnings will be disseminated and which sources are reliable.
- Community educated to recognise simple hydro-meteorological and geophysical signals for immediate response.
- Community educated on how to respond to different types of hazards once an early warning message is received.
- Public awareness and education strategies on-going and with a long-term focus.
- Public awareness and education built in to school curricula from primary schools to university level.
- Mass media and folk or alternative media utilized to improve public awareness.
- Pilot or trial awareness programmes to test effectiveness developed.
- Public awareness and education campaign tailored to the specific need of each audience (e.g. women, children, disabled, emergency managers, media).
- Strategies and programmes evaluated at least once per year and updated where required.

Cross-Cutting Issue:

GOVERNANCE AND INSTITUTIONAL ARRANGEMENTS

Aim: *Develop national institutional, legislative and policy frameworks that support the implementation and maintenance of effective early warning systems.*

Key Actors

Political leaders; policy makers (e.g. environment, development and planning departments); international, national and local disaster management agencies; meteorological and hydrological organizations; geophysical experts; researchers and academics; non-government organizations; organizations and community representatives involved in front-line disaster management; international and UN agencies such as UNDP, UNEP, FAO, UNESCO, UNISDR, WMO, World Bank and regional development banks, IFRC.

Checklist

1. Early Warning Secured as a Long Term National and Local Priority

- Economic benefits of early warning highlighted to senior government and political leaders using practical methods such as a cost-benefit analysis or financial analysis of previous disasters.
- Examples and case studies of successful early warning systems collected and disseminated to senior government and political leaders.
- Early warning role models or “champions” engaged to advocate early warning and promote its benefits to key decision-makers and the community.
- As a minimum, the priority natural hazard risk requiring an early warning system identified, and operational arrangements within a multi-hazard framework established.
- Early warning integrated into national economic planning.

2. Legal and Policy Frameworks to Support Early Warning Established

- National legislation or policies developed to provide an institutional and legal basis for implementing multi-hazard early warning systems.
- Clear roles and responsibilities defined for all organizations (government and non-government) involved in early warning.
- Overall responsibility and authority for coordination of early warning assigned to one national agency and one political leader or senior government official empowered by law as the national decision maker.
- Policies developed to decentralise disaster management, to ensure early warning is people-focused and community participation encouraged.
- Local decision making and implementation of early warning systems linked to broader national administrative and resource capabilities at the national or regional level.
- Regional and cross-border agreements established with neighbouring countries to ensure early warning systems are integrated where appropriate.
- Relationships and partnerships between all organizations or groups involved in early warning activities institutionalised and coordination mechanisms developed and mandated through legislation.
- Early warning integrated into disaster reduction policies and development policies.
- Monitoring and enforcement regime in place to support new policies and legislation.

3. Institutional Capacities Assessed and Enhanced

- Capacities of all organizations and institutions involved in early warning assessed (e.g. consider organizational arrangements; and human and physical resources) and sustainable capacity building plans and training programmes developed and resourced.
- Institutional infrastructure and capacity strengthened at the national, local and provincial level.
- Non-governmental sector engaged and encouraged to contribute to capacity building.

4. Financial Resources Secured

- An on-going government funding mechanisms for early warning and disaster preparedness developed and institutionalised.
- Public/private partnerships to assist with on-going funding investigated.