EWC III
Third International Conference on Early Warning

From concept to action

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Developing
Early Warning Systems:

A Checklist

International Strategy for Disaster Reduction

ISDR

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) held in Bonn, Germany from 27-29 March 2006 provided the opportunity to present new and innovative early warning projects and to discuss natural hazards and risks around the world and how their impacts can be minimised through the implementation of people-centred early warning. The present document "Developing Early Warning Systems: A Checklist" was developed as a conference outcome, to both inform and draw upon the discussions and practical examples raised during the conference, and to support the implementation of the early warning components of the Hyogo Framework for Action.

The Checklist, which is structured around the four key elements of effective early warning systems, aims to be a simple list of the main elements and actions that national governments or community organizations can refer to when developing or evaluating early warning systems, or simply checking that crucial procedures are in place. It 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.

Acknowledgements

"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 2005-2015: Building the Resilience of Nations and Communities to Disasters, Paragraph 16.

WHAT'S INSIDE

This document aims to present a short, simple checklist of basic elements, actions and good practices associated with effective early warning systems. It is intended to be a non-technical reference tool rather than an extensive '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. The second part is a series of practical checklists of actions and initiatives that should be considered when developing or evaluating early warning systems.

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

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

An explanation of the main 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 presented at the beginning of each of the checklists.

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 the importance of this issue to the sustainability and cohesiveness of effective early warning systems.

Each of the checklists is grouped under a series of major themes and includes a simple list of actions or steps that, if followed, will provide a solid basis upon which to build or assess an early warning system.

> *"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

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 to reduce the possibility of personal injury, loss of life and damage to property and the environment.
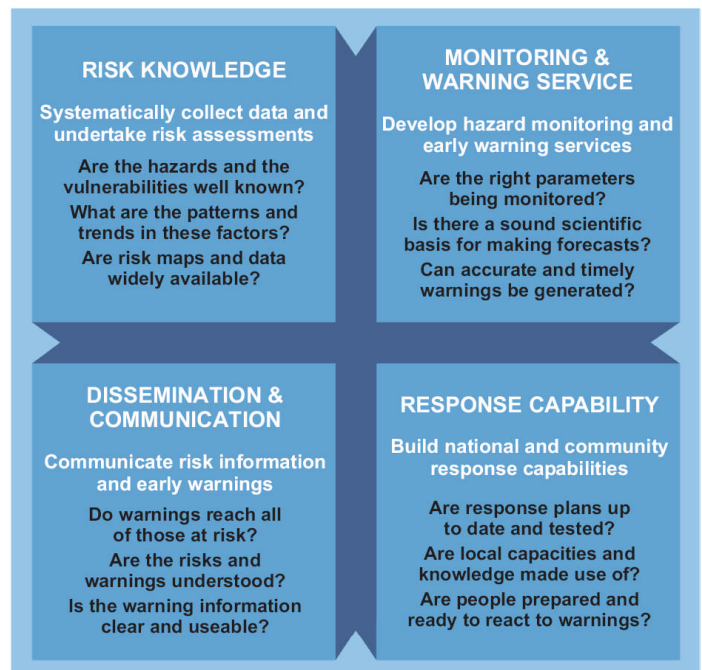
A complete and effective early warning system comprises four inter-related elements, spanning knowledge of hazards and vulnerabilities through to preparedness and capacity to respond. Best practice early warning systems also have strong inter-linkages and effective communication channels between all of the elements.

Risk Knowledge

Risks arise from the combination of hazards and vulnerabilities at a particular location. Assessments of risk require systematic collection and analysis of data and should consider the dynamic nature 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 disaster prevention and responses.

Monitoring and Warning Service

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

networks.

RISK KNOWLEDGE

Systematically collect data and undertake risk assessments

Are the hazards and the vulnerabilities well known?
What are the patterns and trends in these factors?
Are risk maps and data widely available?

MONITORING & WARNING SERVICE

Develop hazard monitoring and early warning services

Are the right parameters being monitored?
Is there a sound scientific basis for making forecasts?
Can accurate and timely warnings be generated?

DISSEMINATION & COMMUNICATION

Communicate risk information and early warnings

Do warnings reach all of those at risk?
Are the risks and warnings understood?
Is the warning information clear and useable?

RESPONSE CAPABILITY

Build national and community response capabilities

Are response plans up to date and tested?
Are local capacities and knowledge made use of?
Are people prepared and ready to react to warnings?

Four Elements of People-centred Early Warning Systems

Source: UN/ISDR Platform for the Promotion of Early Warning

Dissemination and Communication

Warnings must reach those at risk. Clear messages containing simple, useful information are critical to enable proper responses that will help safeguard lives and livelihoods. Regional, national and community level communication systems must be pre-identified and appropriate authoritative voices established. The use of multiple communication channels is necessary to ensure as many people as possible are warned, to avoid failure of any one channel, and to reinforce the warning message.

Response Capability

It is essential that communities understand their risks; respect the warning service and know how to react. Education and preparedness programmes play a key role. It is also essential that disaster management plans are in place, well practiced and tested. The community should be well informed on options for safe behaviour, available escape routes, and how best to avoid damage and loss to property.

2. Cross-cutting Issues

There are a range of overarching issues that should be taken into account when designing and maintaining effective early warning systems.

Effective Governance and Institutional Arrangements

Well-developed governance and institutional arrangements support the successful development and sustainability of sound early warning systems. They are the foundations 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 long-term political commitment and effective institutional arrangements. Effective governance arrangements should encourage local decision-making and participation which are supported by broader administrative and resource capabilities at the national or regional level.

Vertical and horizontal communication and coordination between early warning stakeholders should also be established.

A Multi-Hazard Approach

Where possible, early warning systems should link all hazard-based systems. Economies of scale, sustainability and efficiency can be enhanced if systems and operational activities are established and maintained within a multi-purpose framework that considers all hazards and end user needs.

Multi-hazard early warning systems will also be activated more often than a single-hazard warning system, and therefore should provide better functionality and reliability for dangerous high intensity events, such as tsunamis, that occur infrequently. Multi-hazard systems also help the public better understand the range of risks they face and 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 local authorities and communities at risk, government and institutional interventions and responses to hazard events are likely to be inadequate.

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

Consideration of Gender Perspectives and Cultural Diversity

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

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

3. Key Actors

Developing and implementing an effective early warning system requires the contribution and coordination of a diverse range of individuals and groups. The following list provides a brief explanation of the types of organizations and groups that should be involved in early warning systems and their functions and responsibilities.

Communities, particularly those most vulnerable, are fundamental to people-centred early warning systems. They should be actively involved in all aspects of the establishment and operation of early warning systems; be aware of the hazards and potential impacts to which they are exposed; and be able to take actions to minimize the threat of loss or damage.

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

National governments are responsible for high-level policies and frameworks that facilitate early warning and for the technical systems that predict and issue national hazard warnings. National governments should interact with regional and international governments and agencies to strengthen early warning capacities and ensure that warnings and related responses are directed towards the most vulnerable populations. The provision of support to local communities and governments to develop operational capabilities is also an essential function.

Regional institutions and organizations play a role in providing specialized knowledge and advice which supports national efforts to develop and sustain early warning capabilities in countries that share a common geographical environment. In addition, they encourage linkages with international organizations and facilitate effective early warning practices among adjacent countries.

International bodies can provide international coordination, standardization, and support for national early warning activities and foster the exchange of data and knowledge between individual countries and regions. Support may include the provision of advisory information, technical assistance, and policy and organizational support necessary to aid the development and operational capabilities of national authorities or agencies.

Non-governmental organisations play a role in raising awareness among individuals, communities and organizations involved in early warning, particularly at the community level. They can also assist with implementing early warning systems and in preparing communities for natural disasters. In addition, they can 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 a vital role in improving the disaster consciousness of the general population and disseminating early warnings. The private sector also 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.

The science and academic 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 central 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 into comprehensible messages, and to the dissemination of understandable warnings to those at risk.

Key Element 1:   RISK KNOWLEDGE

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

Key Actors

International, national and local disaster management agencies; meteorological and hydrological organizations; geophysical experts; social scientists; engineers; land use and urban planners; researchers and academics; organizations and community representatives involved in disaster management; international and UN agencies such as WMO, UN/ISDR, UNEP, UNU-EHS, UNOSAT, UNDP, FAO, UNESCO.

Checklist

1. Organizational Arrangements Established

☐ Key national government agencies involved in hazard and vulnerability assessments identified and roles clarified (e.g. agencies responsible for economic data, demographic data, land use planning, social data etc).

☐ Responsibility for coordinating hazard identification, vulnerability and risk assessment assigned to one national organization.

☐ Legislation or government policy mandating the preparation of hazard and vulnerability maps for all communities in place.

☐ National standards for the systematic collection, sharing and assessment of hazard and vulnerability data developed, and standardized with neighbouring or regional countries, where appropriate.

☐ Process for scientific and technical experts to assess and review the accuracy of risk data and information developed.

☐ Strategy to actively engage communities in local hazard and vulnerability analyses developed.

☐ Process to review and update risk data each year, and include information on any new or emerging vulnerabilities and hazards established.

2. Natural Hazards Identified

☐ Characteristics of key natural hazards (e.g. intensity, frequency and probability) analysed and historical data evaluated.

☐ Hazard maps developed 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.

☐ 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 and mapped).

4. Risks Assessed

☐ Interaction of hazards and vulnerabilities assessed to determine the 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 information and national level data.

☐ Activities that increase risks identified and evaluated.

☐ Results of risks assessment integrated into local risk management plans and warning messages.

5. Information Stored and Accessible

☐ Central 'library' or GIS database established to store all disaster and natural hazard risk information.

☐ Hazard and vulnerability data available to government, the public and the international community (where appropriate).

☐ 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 services; specialised observatory and warning centres (e.g. for water, volcano); universities and research institutes; private sector equipment suppliers; telecommunications authorities; quality management experts; regional technical centres; UN agencies such as UN/ISDR, WMO, FAO, UNESCO, UNEP, UNOSAT, OCHA, ITU.

Checklist

1. Institutional Mechanisms Established

☐ Standardized process, and roles and responsibilities of all organizations generating and issuing warnings established and mandated by law.

☐ Agreements and interagency protocols established to ensure consistency of warning language and communication channels where different hazards are handled by different agencies.

☐ An all-hazard plan to obtain mutual efficiencies and effectiveness among different warning systems established.

☐ Warning system partners, including local authorities, aware of 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, including the national platform for disaster risk reduction.

☐ 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

☐ Measurement parameters and specifications documented for each relevant hazard.

☐ Plans and documents for monitoring networks available and agreed with experts and relevant authorities.

☐ Technical equipment, suited to local conditions and circumstances, in place and personnel trained in its use and maintenance.

☐ Applicable data and analysis from regional networks, adjacent territories and international sources accessible.

☐ Data received, processed and available in meaningful formats in real time, or near-real time.

☐ Strategy in place for obtaining, reviewing and disseminating data on vulnerabilities associated with relevant hazards.

☐ 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 within international standards and protocols.

☐ Warning analysts trained to appropriate international standards.

☐ Warning centres equipped with appropriate 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.

☐ Warnings generated and disseminated in an efficient and timely manner and in a format suited to user needs.

☐ 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 people and communities are warned in advance of impending natural hazard events and facilitate national and regional coordination and information exchange.*

Key Actors

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

Checklist

1. Organizational and Decision-making Processes Institutionalised

☐ Warning dissemination chain enforced through government policy or legislation (e.g. message passed from government to emergency managers and communities etc).

☐ Recognized authorities empowered to disseminate warning messages (e.g. meteorological authorities to provide weather messages, health authorities to provide health warnings).

☐ 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 or cross border early warning centres defined, including the dissemination of warnings to neighbouring countries.

☐ Volunteer network trained and empowered to receive and widely disseminate hazard warnings to remote households and communities.

2. Effective Communication Systems and Equipment Installed

☐ Communication and dissemination systems tailored to the needs of individual communities (e.g. radio or television for those with access; and sirens, warning flags or messenger runners for remote communities).

☐ Warning communication technology reaches the entire population, including seasonal populations and remote locations.

☐ International organizations or experts consulted to assist with identification and procurement of appropriate equipment.

☐ Multiple communication mediums used for warning dissemination (e.g. mass media and informal communication).

☐ Agreements developed to utilise private sector resources where appropriate (e.g. amateur radios, safety shelters).

☐ Consistent warning dissemination and communication systems used for all hazards.

☐ Communication system is two-way and interactive to allow for verification that warnings have been received.

☐ Equipment maintenance and upgrade programme implemented and 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. for diverse cultural, social, gender, linguistic and educational backgrounds).

☐ Warning alerts and messages are geographically-specific to ensure warnings are targeted to those at risk only.

☐ Messages incorporate the understanding of the values, concerns and interests of those who will need to take action (e.g. instructions for safeguarding livestock and pets).

☐ Warning alerts clearly recognisable and consistent over 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; international; national and local disaster management agencies; regional disaster management agencies; international and UN agencies such as OCHA, UNDP, UNEP, FAO, UNESCO, UN/ISDR, 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).

□ Public perception of natural hazard risks and the warning service analysed to predict community responses.

□ Strategies to build credibility and trust in warnings developed (e.g. understanding difference between forecasts and 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.

□ Disaster preparedness and response plans targeted to the individual needs of vulnerable communities.

□ 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 responses analysed, and lessons learnt incorporated into disaster management plans.

□ Strategies implemented to maintain preparedness for recurrent hazard events.

□ Regular tests and drills undertaken to test the effectiveness of the early warning dissemination processes and responses.

3. Community Response Capacity Assessed and Strengthened

□ Community ability to respond effectively to early warnings assessed.

□ Response to previous disasters analysed and lessons learnt incorporated into future capacity building strategies.

□ Community-focused organizations engaged to assist with capacity building.

□ Community and volunteer education and training programmes developed and implemented.

4. Public Awareness and Education Enhanced

□ Simple information on hazards, vulnerabilities, risks, and how to reduce disaster impacts disseminated to vulnerable communities and decision-makers.

□ Community educated on how warnings will be disseminated and which sources are reliable and how to respond to different types of hazards after an early warning message is received.

□ Community trained to recognise simple hydro-meteorological and geophysical hazard signals to allow immediate response.

□ On-going public awareness and education built in to school curricula from primary schools to university.

□ Mass media and folk or alternative media utilized to improve public awareness.

□ Public awareness and education campaigns tailored to the specific need of each audience (e.g. children, emergency managers, media).

□ Public awareness strategies and programmes evaluated at least once per year and updated where required.

Cross-Cutting Issue: GOVERNANCE AND INSTITUTIONAL ARRANGEMENTS

Aim: *Develop 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; researchers and academics; non-government organizations; international and UN agencies such as UNDP, UNEP, FAO, UNESCO, UN/ISDR, 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 of previous disasters.

☐ Examples and case studies of successful early warning systems disseminated to senior government and political leaders.

☐ Early warning role models or "champions" engaged to advocate early warning and promote its benefits.

☐ 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 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.

☐ One political leader or senior government official empowered by law as the national decision maker.

☐ Policies developed to decentralise disaster management and encourage community participation.

☐ Local decision making and implementation of early warning systems placed within broader administrative and resource capabilities at the national or regional level.

☐ Regional and cross-border agreements established to ensure early warning systems are integrated where possible.

☐ Relationships and partnerships between all organizations involved in early warning institutionalised and coordination mechanisms mandated.

☐ Early warning integrated into disaster reduction and development policies.

☐ Monitoring and enforcement regime in place to support policies and legislation.

3. Institutional Capacities Assessed and Enhanced

☐ Capacities of all organizations and institutions involved assessed and capacity building plans and training programmes developed and resourced.

☐ Non-governmental sector engaged and encouraged to contribute to capacity building.

4. Financial Resources Secured

☐ Government funding mechanism for early warning and disaster preparedness developed and institutionalised.

☐ Access to funding at the international or regional level explored.

☐ Public/private partnerships utilised to assist with early warning system development.

ACRONYMS LIST

EWC III	Third International Conference on Early Warning
FAO	Food and Agriculture Organization
IFRC	International Federation of Red Cross and Red Crescent Societies
ITU	International Telecommunication Union
NGO	Non-Governmental Organization
OCHA	Office for the Coordination of Humanitarian Affairs of the United Nations Secretariat
UN	United Nations
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UN/ISDR	United Nations International Strategy for Disaster Reduction
UNOSAT	United Nations initiative to provide the humanitarian community with access to satellite imagery and Geographic Information System services
UNU-EHS	United Nations University Institute for Environment and Human Security
PPEW	Platform for Promotion of Early Warning
WMO	World Meteorological Organization

Contact Information

This document is an outcome of the Third International Conference on Early Warning (EWC III) hosted by the Government of Germany under the auspices of the United Nations, from 27 to 29 March 2006 in Bonn, Germany.