

**REPORT OF THE ESCAP-IDNDR REGIONAL SURVEY ON  
ASSESSMENT OF ACHIEVEMENTS DURING THE INTERNATIONAL  
DECADE FOR NATURAL DISASTER REDUCTION (IDNDR) IN ASIA**

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## INTRODUCTION

In resolution A/RES/51/185 adopted at its fifty-first session, the General Assembly called upon the secretariat of the Decade to continue to facilitate a concerted international approach to improvements in early warning capacities for natural disasters and similar disasters with adverse impact on the environment within the process leading towards the closing event of the Decade. It reaffirmed that the secretariat of the Decade will continue to serve as the substantive secretariat for the preparation of the closing event of the Decade, working with the full support of relevant bodies of the United Nations Secretariat and drawing on the contributions of the organizations of the United Nations system concerned, other international organizations and Governments.

To prepare for the Closing Event of the Decade scheduled for July 1999, the IDNDR Secretariat started the process of data collection, with reference to contributions and accomplishments achieved during the Decade in the Fall of 1997. The Event will consist of the review by the Economic and Social Council of the United Nations of the achievements of the Decade and of the need for further institutional support to disaster reduction by the United Nations. The second part of the Event will consist of a Programme Forum, to be organized in Geneva in cooperation with agencies of the United Nations System, which will propose a platform for the future activities in relation to disaster reduction in the 21<sup>st</sup> century.

Within the context of the above direction and in line with the existing close cooperation between the IDNDR Secretariat and ESCAP, a detailed programme of collaboration for the preparation of the Closing Event of the Decade was established at the beginning of 1998. The programme includes a regional survey for Asia and organization of a regional meeting. In July 1998, ESCAP in cooperation with the IDNDR Secretariat started the regional survey. The questionnaire, which was prepared by the IDNDR Secretariat in consultation with ESCAP for its global study on achievements, was adopted for the survey.

As part of the survey, the questionnaire was sent at the end of July 1998 to all the 16 focal points of IDNDR recommended by the IDNDR Secretariat and to all the focal points for water-related and geology-related disasters of the ESCAP networks. As of the end of 1998, 18<sup>1</sup> completed questionnaires were returned to ESCAP as listed in the Summary Table. The active participation of various national agencies and experts in the survey is reflected by the details provided in the completed questionnaires and attachments and the way the questionnaires were transmitted to ESCAP. In several cases, the questionnaires were sent to ESCAP directly by fax together with a copy by airmail and through the IDNDR Secretariat.

This report presents a summary of the main features of the information provided by the returned questionnaires as an introduction to the detailed analysis on water-related and geology-related disasters to be conducted separately by ESCAP consultants for discussion during the IDNDR-ESCAP Regional Meeting for Asia.

### 1. CONTEXT AND DESIGN OF THE SURVEY

#### a. Geographical context

The part of the Asian region designated by the IDNDR Secretariat for the survey covers the North-East, South and South-East Asian subregions with a total population of 3 billion people and the total land area of more 20 million km<sup>2</sup>. Many countries of these three subregions of ESCAP are severely affected by various types of annual disasters, most importantly tropical cyclones, floods, drought and earthquakes. Most of the countries in these subregions are developing countries, including seven least developed countries. The impacts of natural disasters in these countries are therefore important not only in terms of economic aspects but also because of severe social implications.

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<sup>1</sup> An additional completed questionnaire received on 28 January 1999 could not be included in this report.

**b. Other related ESCAP's ongoing efforts**

Natural resources reduction activities of ESCAP started 50 years ago, when the Bureau for Flood Control (now the Water and Mineral Resources Section) was established in 1949 to advise and assist member governments with regard to flood control and related river problems. 1999 thus marks the fiftieth year of ESCAP's contributions to flood control and management in the region in particular and to water resources management in general. With the long experience in regional activities on natural disaster reduction, ESCAP has extended its technical assistance to cover various types of water-related and geology-related disaster reduction activities in Asia and the Pacific. ESCAP has also played major roles in strengthening subregional networks on this area, such as the Typhoon Committee, the Panel on Tropical Cyclones and the Mekong River Commission.

**Table 1. Memberships of the Typhoon Committee, the Panel on Tropical Cyclones and the Mekong River Commission**

Name of Organization	Members
Typhoon Committee	Cambodia, China, D.P.R. of Korea, Hong Kong, China, Japan, Macau, Malaysia, Lao P.D.R., Philippines, Republic of Korea, Singapore, Thailand, United States, Viet Nam
Panel on Tropical Cyclones	Bangladesh, India, Maldives, Myanmar, Oman, Pakistan, Sri Lanka, Thailand
Mekong River Commission	Cambodia, Lao P.D.R., Thailand, Viet Nam

As the survey aims to assess achievements of the Decade at the national and regional levels, a brief summary of achievements through the work of ESCAP is given below for reference. In terms of water-related disaster reduction, the scope of the main activities of ESCAP was extended to address water-related disaster reduction, especially flood control, within the framework of basin development, then the economic and social development process and finally as part of an integrated water resources management programme. Many workshops and seminars were conducted. In collaboration with the IDNDR Secretariat, then UNDRO, ESCAP organized a regional meeting on launching the IDNDR in February 1991. From this joint effort, ESCAP published a two-volume publication on water-related and geology-related natural disasters. ESCAP organized annually the IDNDR Day in collaboration with all United Nations organizations, international and national agencies working on the subject in the region. ESCAP also prepared and presented a Mid-Decade Report on natural disasters in Asia at the Yokohama World Conference in 1995.

A score of publications on this area of work have been produced by ESCAP in its efforts to assist the developing countries in the region to reduce natural disasters, especially by floods. These efforts culminated into detailed guidelines and manuals to facilitate application of regional experiences and transfer of know how. The latest ESCAP publications of this category dealing with detailed guidelines for flood control planning are (1) *Manual and Guidelines for comprehensive flood loss prevention and management* in 1991 and (2) *Guidelines and Manual on Land-Use Planning and Practices in Watershed Management and Disaster Reduction* in 1997. In addition, ESCAP devoted the June issue of the Water Resources Journal to present its annual survey of water-related disasters for the preceding year in its members and associate members. Also in this June issue, assessments of disaster impacts and achievements in disaster reduction discussed at the annual meetings of the Typhoon Committee and the Panel for Tropical Cyclones are presented. Such a review and assessment of past major activities was made in order to identify past strategies of ESCAP in response to the common and/or priority needs on water-related disaster reduction, particularly for flood control and management. Activities of ESCAP in the area of water resources management reflect not only the needs of the member countries but also their priority in regional cooperation, on the basis of the commonality and urgency of these needs.

In its Geology for Planning programme, ESCAP has been working towards inducing decision makers to take geological factors into account, to improve the quality of land-use planning and reduce the effects of natural hazards posed by earthquakes, volcanism, ground subsidence and flooding. This is particularly urgent for the

coastal lowlands of the region, habitat to an estimated 1.7 billion people, and even more so for the urban centres, most of which are located in the coastal zone. The programme strives to guide geologists to present their data in a user-friendly manner, such as thematic maps including hazard zoning, readily understandable to the decision-makers. In this connection, the Forum on Urban Geology in Asia and the Pacific (FUGAP), initiated and established by ESCAP in 1995, has consistently served as a vehicle for creating awareness, sharing experience and arranging for specific training to enhance both technical and communication skills among geoscientists and planners.

Having long involved in water-related and geology-related disaster reduction activities, ESCAP took an active part in the implementation of various Resolutions of the United Nations General Assembly relating to the IDNDR from the conception of the Decade. The Water and Mineral Resources Section of the Environment and Natural Resources Development Division is the focal point for the coordination of the natural disaster reduction activities of ESCAP. The current Regional Meeting marks another collaborative activity of the IDNDR Secretariat and ESCAP that aims to review the achievements during the past decade and to make projections into the future.

**c. Main elements of the survey**

The survey aimed to collect information and data on the following points:

- (a) Progress which has been made, since the inception of the Decade, in the field of disaster reduction as a component of planning and risk management;
- (b) Structures which are in place (institutional and legal structures), in relation to the noted accomplishments including, where applicable, the relative position of the IDNDR National Committees or Focal Points; and
- (c) Future requirements foreseen to formulate and implement the relevant disaster reduction policies effectively in terms of protecting national assets and population and creating those institutional arrangements required to deal with disaster reduction as a part of national policy.

The information and data collected were classified into five categories:

- (i) Experience and recent disasters including impacts, responses and success story,
- (ii) Progress made on various aspects of disaster management planning;
- (iii) Regional/subregional achievements based on national perspectives;
- (iv) Infrastructures in place including legislative framework, training institutions and networking;
- (v) Future requirements for successful implementation of disaster reduction activities in the 21<sup>st</sup> century at the national and international levels.

## **2. SUMMARY OF FINDINGS**

In order to provide the readers an overall picture of the survey, the following statistics are extracted from the 18 returned questionnaires:

- 18 completed questionnaires along with additional information were received from 13 members and one associate member of ESCAP. These responses covered all the three targeted subregions of ESCAP: NorthEast Asia (4), South Asia (4) and SouthEast Asia (6).
- 15 responses were from national government agencies, one from a provincial government agency and two from non-governmental organizations. Five responses indicated that their agencies were the focal points of the national IDNDR programmes dealing with disaster prevention, reduction and management. Nine responses from national agencies responsible for activities related to disaster preparedness. Two agencies were responsible for disaster prevention, preparedness and reduction.

The information provided in the completed questionnaires was compiled in the Summary Table. The main findings are summarized below:

a. Experience and recent disasters

Disasters identified by the responses included floods, cyclones, earthquakes, drought, tornado, debris flow including landslide and mudflow, hailstorms, surge, tsunami and regional haze. The most common disaster experienced practically in all the responding countries was floods. These disasters resulted in loss of lives, serious economic damages and severe impacts on the social conditions. The critical years listed in the responses included all the years from 1992 to 1998 (up to the time of the survey). Although the severity of these events, floods or earthquakes or drought and others, is different from one country to another, the most critical year appeared to be 1998, followed by 1997 and 1995. In 1998 alone, the economic damage in these countries was estimated to be over US\$23 billion (US\$20 billion in China, \$1 billion in Bangladesh, \$1 billion in Republic of Korea, several hundred millions in India and Viet Nam.)

Various measures were adopted by the respective authorities in all the countries and areas to reduce impacts of disasters and to prevent future disasters. They were structural and non-structural measures, short-term and long-term plans or strategies, legislative measures, institutional development and publicity programmes. The non-structural measures included land-use guidelines and zoning, disaster-prone and risk mapping, disaster-proofing measures and warning systems. The wide spectrum of measures taken by the members and associate members of ESCAP indicates a diversity in the experiences and offers good opportunities for information exchange. All the responses believed that further improvement in disaster preparedness and prevention is possible, particularly with respect to warning systems, public awareness in risk management, institutional capacity building, disaster management planning and coordination, construction of structures, application of advance technology, better land-use planning and enforcement of zoning, and most importantly political commitment.

Almost all the responses indicated that the IDNDR had helped their respective countries to give greater attention to disaster reduction. Few responses indicated lack of direct contact with the respective national IDNDR activities. Examples of the importance of IDNDR's contribution are given below:

- (i) "IDNDR has in fact helped our government in taking into consideration the criteria of sustainable development through effective disaster reduction in the planning and implementation of development projects with regard to infrastructure development." (Malaysia)
- (ii) "The Decade has laid down model frameworks which may be adopted by governments in fortifying its disaster management systems." (Philippines National Red Cross)
- (iii) "IDNDR has aroused public awareness and enhanced international cooperation on disaster reduction." (Hong Kong, China)
- (iv) "A national programme in line with IDNDR objectives and resolution is being implemented to minimize the adverse impacts of disaster on population and environment of Bangladesh" (Bangladesh Dhaka Metropolitan Development Planning)
- (v) IDNDR led to the establishment of China National Committee on IDNDR (CNCIDNDR), IDNDR action in China, National Report, China National Plan for Disaster Reduction, China Centre for Disaster Reduction (CCDR), many projects and programs for disaster reduction, etc. China Modern Setup of Disaster Prevention and Reduction is to be established. (CNCIDNDR, China)
- (vi) "Because of IDNDR, it has been possible to get greater commitments of the Government in disaster management and as such project for comprehensive disaster management in Bangladesh with UNDP, UNICEF sponsorship has been taken up by Government for implementation. To build up public awareness at all levels, Government takes up every year elaborate programme for the observance of IDNDR Day and has also introduced 'National Disaster Preparedness Day' for observance on last working day of March every year." (Bangladesh Disaster Management Bureau)

- (vii) "The World Conference on Natural Disaster Reduction in Yokohama 1994 helped us realize the critical situation over the world, in particular in developing countries affected by natural disasters and necessities of international cooperation in the field of disaster mitigation." (Japan)
- (viii) "IDNDR has certainly helped to give greater attention to disaster reduction particularly in the field of activity of the scientific community but there exists wide gaps between planning and its execution due to various reasons." (India)

The above information illustrates a general picture of achievements of the Decade from different angles of disaster management planning and implementation as well as disaster preparedness and risk reduction.

Several examples of "success story" were indicated in the responses from Bangladesh, Malaysia, Myanmar, Republic of Korea, Turkey, and Hong Kong, China. Among these, the most distinguished example from Bangladesh indicated that "Early warning and timely action limited the number of deaths to about one hundred in May 1997. The cyclone of the same intensity of 1988 took 138,000 lives."

#### **b. National achievements**

All the responses confirmed accessibility to national and local warning systems and some indicated their established link with regional and international mechanisms, such as the Typhoon Committee, the Panel on Tropical Cyclones and WMO programmes. Many countries confirmed availability of various components for risk management but only two indicated existence of comprehensive risk assessment at the national level, one at selected localities. Various stages of preparation of structured mitigation plans were indicated in the responses and six countries indicated availability of national structured mitigation plans and one with provincial and local plans.

Various reasons were identified as obstacles by the countries or areas in their efforts to implement the Decade targets. Among these, the lack of financial resources was the prevailing reason, followed by the lack of technical capacities, particularly advance technology and modern equipment, and weakness in coordination and institutional arrangements. Other reasons included that the Decade targets were too ambitious and prioritization would be necessary; lack of strong political commitments; vigorous international efforts would be required.

In order to generate public awareness, various programmes have been adopted at the national, provincial and local levels. Media and publications are widely accepted. Short-term programmes in the form of workshops or seminars and formal education curriculums have been adopted for training purposes. Involvement of decision-makers and major groups to ensure their support and participation in disaster reduction programme was achieved through various established mechanisms and procedures as indicated in almost all the responses. These mechanisms included those responsible for information dissemination, for disaster management planning, policy formulation, strategy implementation and legislative bodies. Collaboration with other sectors was indicated through the established guidelines and mechanisms (Malaysia), information dissemination (Thailand, Hong Kong, China), development plan (Bangladesh), and projects (China, Singapore, Turkey). Seven responses indicated the benefits of the international arena provided by the IDNDR for information exchange. Others did not get direct access to the arena.

#### **c. Regional/subregional achievements**

Important achievements from subregional cooperation were identified in several responses in the field of tropical cyclones, floods, tsunami forecasting as well as training in disaster preparedness and management. Reference was made to the work undertaken within the framework of the Typhoon Committee, the ESCAP/WMO Panel on Tropical Cyclones, UNESCO Tsunami Warning System, Eastern Asia Natural Hazards Mapping Project, the Asian Disaster Preparedness Centre, Asian Centre for Disaster Reduction in Tokyo and lately the ASEAN Regional Haze Task Force (1998). It was believed that regional mechanisms are needed to continue promoting exchange of information and experience. Regional cooperation was also expected to make important contribution to disaster reduction in general and enhancement of resource mobilization, communication networks, warning systems, improvement in forecasting techniques and training.

**d. Infrastructures and legislation established**

All the responses confirmed commitment of the respective Governments to disaster reduction and also the existence of a designated government authority for coordination. However, there were significant difference among the government institutional arrangements for the designated authority. In some cases, the authority was chaired by the Government Head, others chaired by the Minister concerned and one was a parliamentary commission. Budgetary resources were indicated to be available for the purposes. Firm legislative frameworks have been set up as indicated in most of the responses, for disaster management in general or particular disasters such as floods, forest fires, tropical cyclones, earthquakes or development planning. In one response, it was indicated that the comprehensive Act was being drafted.

With respect to education and training on disaster reduction, most of the responses indicated various measures adopted in the respective members and associate members of ESCAP. However, most of the responses indicated the field of training in their respective areas of work. On the perspectives and experience of the respective agencies participating in the survey, the responses indicated a wide diversity in the established networks to aid in the transfer and application of knowledge and technology, information dissemination and international collaboration. The networks referred to included the existing mechanisms such as the Typhoon Committee, the South Asia Association for Regional Cooperation (SAARC), WMO and Japan Meteorological Agency; newly established bilateral project (Malaysia-France, Pakistan-USA and Japan). In one response, it was indicated that the networks were first established for sectoral disasters and developed into multi-sectoral coordination (China.)

**e. Future requirements and priority areas of cooperation**

Most responses indicated their agreement to the importance of the criteria identified in the questionnaire as requirements for successful implementation of disaster reduction activities in the 21<sup>st</sup> century. However, the order of priority of the elements of requirements was different among the responses. Policy and budgetary commitment and public awareness together with strong linkage to economic and social development programmes were commonly accepted as top priority. Other priority included international cooperation, information dissemination, strengthening of local authorities, and network building. Several responses provided additional criteria as necessary conditions for the future operations:

- (1) Proper land-use planning and to apply integrated approach in management of resources.
- (2) Establishment of programmes to promote awareness on disaster prevention and reduction. Cooperation can be made on specific tasks, projects, information dissemination and warning systems, and post disaster management assessment.
- (3) Latest technology be used.
- (4) Improvement of sophisticated numerical models to predict local heavy rainfalls; to simulate tsunamic generation and propagation; to improve seismic observation network.
- (5) To support science and technology transfer. Establish central data and information systems in the region. Cross-sectoral coordination.
- (6) A strong bonding mechanism among the IDNDR related international programs, and national projects is required.
- (7) Build up effective networking at national, regional and global levels.
- (8) TCDC be improved; lack of financial resources; common policy needed in the region; regional network and communication be upgraded.
- (9) More budget resources; strengthening legal system.

All the responses reaffirmed the needs and importance of international cooperation for future disaster reduction activities. Among the top priorities identified by most of the responses were technical assistance, financial support and technology transfer. With regards to technical cooperation, most of the responses attached priority to subregional cooperation on early warning systems, communication networks and disaster preparedness.

With regard to future programmes and measures, several responses identified the need to put in place national disaster reduction programmes (or plans or strategies) with political commitment, proper institutional framework for coordination and resources availability. Several responses confirmed the need to establish or strengthen regional/subregional mechanisms for better interaction, information exchange, forecasting systems, enhanced public awareness and technology transfer. One country suggested that "IDNDR be changed to International Committee on Natural Disaster Reduction (ICNDR) to keep up the momentum at international and national levels."

**f. Remarks**

The responses provided an overwhelming amount of information, including important developments in the legal and institutional frameworks of the respective members and associate members of ESCAP related to disaster reduction. The information provided in the completed questionnaire together with attachments is expected to be analyzed in more detail in two separate papers on the water-related and geology-related disasters. However, various gaps of information could also be identified during this initial analysis and it is hoped that additional information could be further provided during the Regional Seminar by the respective delegations, particularly from those countries, which have not participated in this survey yet.

### **3. CONCLUSIONS**

During the past decade, the region was severely affected by various types of natural disasters, particularly during the past few years. To cope with these disasters, a variety of measures have been adopted and the diversity in the experiences in the region offers good opportunities for effective regional cooperation among the developing countries in the related fields. Most of the responses noted a significant increase in the awareness on the importance of disaster preparedness and in the commitments by the Governments to disaster reduction. In several countries, these commitments were translated into institutional infrastructures to ensure effective mobilization of resources and sustained public participation in the national efforts, such as creation of national disaster reduction coordinating committees, establishment of disaster management systems, formulation of national strategies and action plans, and preparation of disaster management programmes. Apart from the national achievements, the responses also noted achievements of regional efforts in sharing information and experiences as well as in coordination of activities. Examples included the sharing of meteorological data for better flood warnings by Bangladesh, India and Pakistan realized through the Panel on Tropical Cyclones; the achievements of the members of the Typhoon Committee in typhoon tracking and flood forecasting; and the establishment of the Regional Haze Action Plan by ASEAN countries. In this context, space technology applications were highlighted as an important tool for monitoring of natural hazards and related communications. With respect to future requirements, most of the responses endorsed the need to integrate disaster preparedness and mitigation activities into the economic and social development process, to increase public awareness and participation, to strengthen regional networking and transfer of technologies.

In order to have a more complete picture of regional achievements, additional information is necessary, particularly from those countries which have not participated in the survey. The participants to the IDNDR-ESCAP Regional Meeting for Asia: Risk Reduction & Society in the 21st Century are therefore urged to provide the information so as to fill up the gaps.



TABLE 2.

## SUMMARY OF REGIONAL SURVEY ON ASSESSMENT OF ACHIEVEMENTS DURING THE IDNDR DECADE

No	Country	Recent disasters	Progress	Regional results	Structures in place	Future requirements
1.	Singapore Meteorological Service	Transboundary haze pollution. No direct impacts on health and assets, but on tourism and transportation.	Structured plans well coordinated. Formation of local haze taskforce for mitigation. Plans well coordinated. Good linkage with neighbouring countries. Study funded by ADB will be conducted as follow up action.	Member of ASEAN Regional Haze Taskforce.	Singapore Police Force, Singapore Civil Defence Force and Ministry of Environment.	International mechanism and policy commitment. Early warning systems and communications. A well-coordinated natural disaster mitigation program for each country.
2.	Pakistan Federal Flood Commission (FFC), Ministry of Water and Power	Catastrophic floods in 1994 and 1995. Damage to infrastructure, including education and health facilities.	Substantial protection been provided to 250 flood-prone sites. Flood forecasting and warning systems been provided. Assessment made for projects. National Disaster Management Plan made. Comprehensive Flood Warning Manual being prepared.	Since 1990, flood forecasting. Workshops on community participation.	Embodyed in Government structure, priorities, budget and legislation.	Financial resources, technical assistance, technology transfer, directory, establishment of regional warning systems, disaster preparedness and awareness for public. Better regional and sub-regional interaction; state-of-the-art manuals on disaster management facilities; more effective use of space information and technology (real-time); establishment of disaster mitigation directory at national, sub-regional and regional levels.
3.	Malaysia Geological Survey Department	Landslide in 1993, debris flow in 1995 and 1996. Loss of lives and damage to properties.	National Disaster Management & Relief Committee (NDMRC) set up at the federal, state and local levels; early warnings issued by Department of Meteorology. Close cooperation with related agencies. A pamphlet on earthquake disaster has been prepared. Geohazards incorporated into Town and Country Planning and EIAs.	Not much improvement in preparedness and reduction of geologic disasters. More information on climate and rainfall is required.	The NDMRC is chaired by a Cabinet Minister. Training on geological hazards being offered by Department of Geology at the local universities.	Proper land-use planning and application of integrated approach in management of resources are needed. Need (1) technical assistance, (2) financial resources, and (3) technology transfer. A mechanism and strategy on disaster management should be in place.
4.	Malaysia Crisis and Disaster Management Unit, National Security Division, Prime Minister Department	Landslides (93, 95), mudslide (96), typhoon Greg (96), peat/forest fire (98). 361 lives lost, RM200 million damaged, 2,000 ha burnt and have affected health.	Formulation of National Hazard Action Plan, Special Malaysia Disaster Assistance and Rescue Team (SMART), Policy and Mechanism of National Disaster Management Relief (Directive No. 20). Warnings provided by the Malaysian Meteorological Services. Malaysia has a good networking relationship with other countries in exchange information and experiences.	ASEAN Expert Group on Disaster Management in April 98. Signing of MOU between Malaysia and Indonesia in Dec 97. Holding of joint exercises of disaster assistance and rescue teams with Singapore. An ASEAN Ministerial Meeting on Haze was held and the Subregional Fire Fighting Arrangement (RFAs) for Borneo and Sumatra was established in Apr 98. World Conference in Yokohama in Japan in 1994. Natural Disaster Reduction Conference in Australia in 1996, High level seminar on MCDA in Indonesia in 1997, and ASEAN Expert Group Meeting in Singapore in April 1998.	No specific authority. Each agency has its own regulation. RM800 million allocated in the 7th Malaysia Plan (1996-2000) for flood mitigation projects. Environmental Quality Act (74), Land Government Act (76) and Uniform Building By Laws (84). Five Professional Associations Malaysian Institute of Public Works, Malaysian Architects Association, Petroleum National Berhad (Petronas), University Putra Malaysia, National Institute of Public Administration (INTAN) have contributed to disaster reduction. MoU signed with the French Government on training of personnel on disaster management.	Establishment of programmes to promote awareness on disaster prevention and reduction. Non-structure, strengthen disaster management system, training activities, promote public awareness, improve forecasting and warning systems and improve hazard mapping. Structure mitigation measures against landslide and embankments improvement. International cooperation for the transfer of expert knowledge in disaster reduction, to increase awareness and relief services.

No	Country	Recent disasters	Progress	Regional results	Structures in place	Future requirements
5.	Hong Kong, China	Floods and landslides caused by Typhoons Dot (93), Helen (95), Victor (97) and heavy rain in July 94, June and July 97 resulted in severe damage to property, farmland, fish ponds, 10 deaths, disrupt in traffic and social activities	Global QRA of pre-1978 slopes, results published, Hong Kong Contingency Plan for Natural Disasters with operation instructions for each government department; under WMO framework, warning services provided. Special and general education and information programs in place for the public. Legislative authority, policy bureau, departments, organization and media are closely liaised. Regular press conferences, briefings provided. Talks, meetings and education programs carried out. Hong Kong is linked to Beijing, Tokyo and Bangkok to contribute to early warning systems.	More accurate weather prediction products have become available from the regional meteorological centres; Operational exchange of cyclone and rainstorm warnings started since 1996 in the Pearl River Estuary. Participated in the World Conference in Yokohama in 1994	The Security Bureau oversees the Contingency Plan for Natural Disasters.	Need policy & budgetary commitment; public education; multi-media dissemination of information; continue international cooperation. To enhance information communication networks; research in short-range rainfall forecasting and development of human resources through education and training. Application of innovative information technology for weather services; state-of-the-art technology to short-range weather forecasts; promotion of international cooperation
6.	Bangladesh	Cyclone in May 97; Flood in July-Sep 98. Flood of 1998 inundated 3/4 of the country, killed 1,000 people, damaged infrastructure and changed socio-economic scenario. Early warning and timely action taken limited the number of death in 1997 to 100 (as compared with 138,000 deaths in 1991 from the same intensity.)	Comprehensive national assessment of risks (CNAR) under process; National Disaster Management Plan being prepared. Disaster management committees formed at national and local levels. Standing orders issued by Government, legislation being processed. Weather forecasts and early warnings issued through media. Maps and documents published and dissemination through media, seminars and workshops.	Information on cyclone and floods for early warning received from the neighbouring countries. Especially for flood mitigation.	Ministry of Relief, Rehabilitation and Disaster Management. Effective interdisciplinary approach is yet to be developed	Upgrade dissemination of information and strengthen local authorities. Updated technology, financial resources. Humanitarian approach of development policies
7.	India	Earthquakes: Killari (93), Jabalpur (97); Landslide (98); Flood in July-Sep 98. Loss of lives (10,000), severe damage				Policy commitment; budgetary commitment; responsible local authorities; links to social development programs. Disaster preparedness; regional warning system; financial resources. Future disaster reduction programs for floods, cyclones, earthquakes and landslides. Scientific knowledge needs to be applied and provided to local authorities. Enhancement of public awareness. International cooperation required.
8	Turkey	Earthquakes Erzurum in 92, Dinar in 95, Ceyhan-Misis in 98; floods in Izmir in 95 and Black Sea Region in 98. Nearly 1,000 deaths, US\$4 billion loss and structures damaged.	Comprehensive national assessment of risk (CNAR) is being studied under a UNDP project. Structured disaster response plans exist at provincial and local levels. Early warning systems for floods and landslides being developed. Public awareness made through TV spots and pamphlets. GDDA serves a parliamentary investigation commission for hypacts of disasters and makes recommendations. Information exchange in the Balkan Region and cooperation with other international agencies.	Cooperation made for the Black Sea and Mediterranean regions. Needs to enhance scientific and technical cooperation or reduce political tension.	GDDA is the authority under the comprehensive Disaster Law. Legal frameworks enacted by national authorities. Enforcement lies with local governments who often lack manpower. The GDDA and the European Natural Disasters Training Centre, the Turkish Earthquake Foundation and the Turkish National Committee for Earthquake Engineering are key organizations on technology transfer. The Middle East Technical University established a centre to deal with this.	Link with social and economic development programs. Public awareness. Regional early warning systems, information networks and technology transfer are necessary. Active participation of agencies and communities is essential. Six principles were recommended as guidelines for disaster reduction in the 21st century.

No	Country	Recent disasters	Progress	Regional results	Structures in place	Future requirements
9.	Philippines  Philippines Red Cross, Manila	Drought caused by El Nino in 97/98, typhoons: Gloria, 96, Angela, 95, Kadiang, 93; Mindoro earthquake, 93 and lahars avalanches in Central Luzon (92-96). Loss of lives, impacts on health, displacement of the poor, economic slow down due to destruction of infrastructure and agriculture production; rephasing of development	A tool for Comprehensive National Assessment of Risks (CNAR) being developed. National disaster management plans exist. Training programs developed and interactive learning strategies adopted for public awareness programs. Work contributed more on health and emergency responses. Coordination with other sectors worked well.		Response not proactive.	
10.	China  China National Committee on IDNDR	Rainstorm-flood, drought, typhoon-surge, earthquake, hailstorm, snowstorm, landslide, mudflow, forest fire, insects, pests, etc. Impacts ranked as above.	CNAR was published in the National Report. Needs financial support. Media is used. Annual meetings with those concerned. Cooperation with UNDP, World Bank, ADB assistance.		CNCDNDR is the national authority. Budgets allocated to Line Ministries. Legislatives exist for floods, earthquake, forest fire, etc. Disaster reduction concept incorporated in training under the auspices of the Chinese Academy of Sciences. Networks first developed for sectoral disasters then extended to multisectoral ones (CCDR). Interdisciplinary approach through CCDR.	IDNDR be changed to International Committee on Natural Disaster Reduction (ICNDR) to keep up the momentum at international and national levels. Information dissemination be continued and strengthened. International assistance be provided to China and the Third World
11	Pakistan  Pakistan Meteorological Department,	Flood of 97 and earthquake on 28 Feb 97. Many people killed, heavy loss of animals and damage to properties.	CNAR not available. Early warnings with weather data received from India and Bangladesh. Public awareness made through media.	Data exchange and early warning systems be improved.	Emergency Relief Cell (ERC) in Cabinet Division. Budget allocated with concerned agencies. Legislatives available. Collaboration with USA and Japan.	Latest technology be used. Technology transfer, technical assistance and financial resources. International seminars and workshops be organized.
12.	Thailand  Environmental Geology Section, Department of Mineral Resources	Floods, cyclones, land subsidence, karst collapse, coastal erosion and earthquake Floods and cyclones are main disasters with loss of lives and damage to assets. Earthquake is seldom.	CNAR not yet available. Improve flood forecasting network. Implementation of modern techniques for monitoring and warning. Public awareness through poster and paper presentation. GIS for policy makers, planners and local governments. Provided geohazard data to agencies and private sector.	Eastern Asia Natural Hazards Mapping Project to compile natural hazard maps	Ministry of Interior. Legislative available Enhance awareness on importance of geoscience in coastal zone management and natural hazards. Works mainly with geologists.	To support science and technology transfer. Establish central data and information systems in the region. Cross-sectoral coordination Technology transfer and disaster preparedness. Warning system and protection measures and monitoring
13.	Bangladesh  Bangladesh Nari Pragati Sangha, BNPS, Dhaka	Floods and cyclones. Massive damage, food shortage, threat to health, environmental hazards and non-availability of drinking water.	Government has established a disaster management plan in 1996. It has a network for early warning system. Recently, India has agreed to provide early warning on natural calamities like flood or cyclone to Bangladesh. The Flood Action Plan was considered to have caused serious threats to the environment. Government has increasingly involved NGOs in its programs. Government and NGOs have developed good information base.	Took part in World Conference in 1994. Regional cooperation may help reduce disasters such as floods in 1998.	Yes, but not well equipped. Budget not enough. Government agencies looked disintegrated in this respect. Not many educational institutions involved. South Asia Association for Regional Cooperation (SAARC) has a small unit on disaster reduction. BNPS has a network of 19,000 women members in rural areas.	Network building, information dissemination and budgetary commitment. Regional or subregional warning system and financial resources followed by technology transfer and technical assistance. Formulation of comprehensive policy is required.

No	Country	Recent disasters	Progress	Regional results	Structures in place	Future requirements
14	Japan Japan Meteorological Agency	Warnings issued against storm, heavy rain, heavy snow, storm surge, high waves, and flood	Comprehensive National Assessment of Risks (CNAR) not available. Holding seminars, "Weather Festivals" and provide information to the general public. JMA established communication systems to disseminate information as stipulated in the Meteorological Service Law.	JMA provided numerical prediction data through Regional Specialized Meteorological Centre (RSMC) and meteorological products, satellite imagery and typhoon track forecasts to the members of the Typhoon Committee since 1995. Assisted Fiji and Bangladesh to strengthen their warning systems. JMA held regional seminars and training courses on typhoon disaster prevention, to improve accuracy of typhoon track forecasts.	Disaster Countermeasures Act designates agencies to be responsible at national and local levels. Disaster Countermeasures Basic Act and Large-scale Earthquake Countermeasures Act. Disaster Prevention Research Institute of Research made by Universities RSMC Data Serving System provides East Asia with prediction and data through the Internet.	JMA continues to improve sophisticated numerical models to predict local heavy rainfalls; to simulate tsunami generation and propagation, to improve seismic observation network
15.	Republic of Korea Korea Meteorological Administration (KMA)	Drought, typhoon, flood, severe storm and gale. Loss of lives, heavy damage. Regular inspection of disaster-prone areas; construction of disaster prevention facilities, allocation of resources.	CNAR published; yes; to provide warnings and advices on prevention and mitigation of natural disasters. Earthquake monitoring and tsunami warnings. Public awareness through Mass-media and internet	KMA is a competent authority of the International Coordination Group for the Tsunami Warning System (TWS) of UNESCO. KMA proposed to establish a regional tsunami warning centre for the Far East Seas. Gained knowledge and experience through information exchange	US\$78 million allocated to 15 cities and 230 counties. Funds can be used only for disaster reduction. Legislations available. Disaster prevention education and drills and practice emergencies. A Website is operated by KMA	A strong bonding mechanism among the IDNDR related international programs and national projects is required. Regional/subregional warning systems be adopted for regional/subregional events. Political commitment is required. Substantive measures at the regional/subregional level are required
16	Bangladesh Disaster Management Bureau	Cyclone, flood, drought, tornado, earthquake. Property and infrastructure damage. Cholera outbreak. Reduction of impacts of May 97 cyclone.	CNAR study made but not published yet. Disaster Management Plan to be published in 1999. Early cyclone warnings issued in real time through national broadcasting network. A system of two-hour lectures have been introduced at all training institutes. In curricula of class V to XII. Training modules prepared. Four committees established for policy makers, local authorities, NGOs and media to meet regularly.	Regional cooperation helped reduce damage in 1997 flood. Member of WMO/ESCAP Panel on Tropical Cyclones. Regional mechanism is needed to promote exchange of information and experience.	Ministry of Disaster Management and Relief with its Disaster Management Bureau (DMB) Draft Act being prepared. Existing Directives and curricula development	Build up effective networking at national, regional and global levels. Technology transfer, financial support and technical assistance and balanced institutional development. Political and financial commitments at national and international levels are required
17	Myanmar Department of Meteorology and Hydrology (DMH)	Floods in July/Sep 97. Loss of lives, property and agricultural production.	CNAR not available, but only for subplans being prepared. Flood risk done for some areas. A map of earthquake prone areas has been made. Early warning system on weather and climate available to public with early flood warnings. Training courses organized in townships. Committees of all agencies formed to deal with disasters. Fire insurance adopted and relief donations mobilized. Myanmar is a member of ASEAN-RESED Project of ASEAN on seismology.	Disaster management training programme was organized in 1994 with high-level participation. Myanmar participates in regional events on disaster reduction. Exchange of data and information be improved and through computer network. Technology transfer.	National Disaster Management Committee, headed by Minister of Social Welfare. Budget allocated to related Departments. Legal framework exists for land-use planning, water and forest management, building codes, etc. Curricula with Yangon Institute of Technology and Department of Geology. DMH computer is linked with the neighbouring countries.	TCDC be improved, lack of financial resources, common policy needed in the region; regional network and communication be upgraded; disaster reduction be integrated into economic and social development and environmental protection. Financial and technical assistance required and technology transfer. National Action Plan be formulated and revised regularly
18	Viet Nam Standing Office of the Central Committee for Flood and Storm Control (CCFSC)	Flood, storm, drought, flash flood, landslide & mudflows, hailstorms, tornadoes. Annual severe damage.	CNAR not yet available, but being prepared. Strategy & action plan documented and disseminated in 1994. Early warning well practiced. Public awareness campaign is made through training of local officials, NGOs and mass media.	Improvement in disaster management from better flow of related information. Associated with ADPCC, Asian Centre for Disaster Reduction in Tokyo	The CCFSC, with its annual budget is a commitment at the top-level to disaster reduction. A firm legal framework has been established. Disaster-reduction curricula yet to be developed	More budget resources. Disaster reduction must be integrated in economic and social development process. Strengthening legal system; Capacity building; Better information dissemination; and better mechanism for international coordination. Financial resources; quicker information exchange; regional network; technology transfer; and technical assistance.