ACCOMPLISHMENTS, CURRENT ACTIVITIES AND FUTURE REQUIREMENTS FOR DISASTER REDUCTION IN MALAYSIA

CONTENTS

1. INTRODUCTION

Although Malaysia is geographically outside the ?Pacific Rim of Fire? and is relatively free from any severe ravages and destruction caused by natural disasters such as earthquake, typhoons and volcanic eruptions, nevertheless the country is subjected to monsoonal floods, landslides and severe haze episodes. The country also from time to time experiences some man-made disasters which causes considerable damages to property and loss of lives. To mention a few, Malaysia had experienced disasters (natural and man-made) during the last five years as follows:

i. Fire and explosions at Bright Sparklers factory in Sungai Buloh in 1991 which claimed 22 lives.

ii. Fire and explosions at South Port Klang in 1992 which claimed 10 lives.

iii. Collapse of Highland Towers Condominium at Hulu Kelang in 1993 which claimed 48 lives.

iv. Landslide at Genting Highlands in 1995 which claimed 20 lives.

v. Mudslide at the Aborigines village at Pos Dipang, Perak on 29 August 1996 which claimed 44 lives and the damage of 30 houses.

vi. Tropical Storm ?Greg? which struck Keningau, Sabah in December 1996 which claimed 238 lives.

vii. Severe haze episodes in July - November 1997 caused by forest fires which had adverse health effects on the people and on the economy of the nation.

viii. Landslide at Sandakan, Sabah on 7 February, 1999 due to heavy downpour which claimed 17 lives and damaged 4 houses.

Experience from the above mentioned disasters indicated that there is a need to address disaster mitigation problems efficiently and effectively to alleviate the suffering of the people and reduce the loss of lives and damage to properties.

This paper outlines the disaster management and relief mechanisms and summarises some of the accomplishments, current activities and future requirements for Disaster Reduction in Malaysia.

2. MECHANISMS OF DISASTER MANAGEMENT AND RELIEF

2.1. The National Security Division

The National Security Division (NSD) in the Prime Minister?s Department is responsible for coordination of all activities related to disaster. The National Security Council (NSC) Directive No. 20 was issued to provide guidelines on the management of disasters including the responsibilities and functions of the various agencies under an integrated emergency management system.

2.2. Disaster Management and Relief Committee

To carry out the responsibilities of the NSC of coordinating all the activities related to disaster, i.e. the various aspect of preparation, prevention, response, recovery and rehabilitation, The Disaster Management and Relief Committee was established at three different levels, i.e. at the Federal, State and District levels, whereby the NSD is the Secretariat. The main functions of the Disaster Management and Relief Committee (DMRC) are as follows:

i. At Federal level, DMRC is responsible in the formulation of national polices and strategies regarding the alertness and the preparation of various agencies involved in the handling of disasters. The DMRCs at the State and District levels are required to implement and carry out such policies and strategies.

ii. To ensure sound coordination among the agencies involved in the handling of disasters and determine the roles of the principal emergency services (Police, Medical and Fire Department) and other supporting services.

iii. To activate the Disaster Operation Control Centre at District, State or Federal Level whenever required.

iv. To coordinate and mobilise whatever resources and logistics available from Government agencies and if necessary also from the private sector.

v. To coordinate assistance and rehabilitation to disaster victims.

vi. To carry out ?post mortem? and report upon completion of the disaster operations for the purpose of recording and performance evaluation for future reference and planning.

2.3. Composition Of Disaster Management And Relief Committee

The members of the Disaster Management and Relief Committee are as follows:

i. Federal Level

Chairman : Minister of Information.

Members : Minister of National Unity and Community Development.

Minister of Finance.

Chief Secretary to the Government.

Chief of Armed Forces.

Inspector General of Police.

Director General of Health.

Director General of National Security Division.

Director General of Fire and Rescue Department.

Director General of Atomic and Energy Licensing Board.

Director General of Road and Transport Department.

Director General of Public Work and Utilities Department.

Director General of Department of Environment.

Director General of Meteorological Department.

Director General of Drainage and Irrigation Department.

Representatives from Ministry of Finance and Attorney General Office.

Director General of Department of Occupational Safety and Health.

Secretary : Director

Crisis and Disaster Management Unit

National Security Division

Prime Minister?s Department.

ii. State Level

Chairman : State Secretary.

Members : State Chief Police Officer

Brigade Commander of Armed Forces

State Director of Fire and Rescue Department

State Director of Health

Other Directors of various relevant government agencies / departments at State Level.

Secretary : Director of State NSD.

iii. District Level

Chairman : District Officer

Members : Officer in charge of Police District (OCPD)

District Fire Officer

Medical and Health Officer

Representatives from various relevant departments and agencies at District Level

Secretary : Assistant Director for District NSD.

2.4. On-Scene Control Post (OSCP)

An On-Scene Control Post (OSCP) will be opened immediately as soon as disaster has occured. The On-Scene Commander will be either the OCPD, CPO, or the Director, Internal Security and Public Order Royal Malaysia Police, depending on the level of disaster. The main functions of the On-Scene Commander are as follows:

i. To make an early assessment at the scene of potential or actual disaster and immediately activate OSCP if deemed necessary.

ii. To identify the equipment and logistic requirement in handling the disaster.

iii. To coordinate the functions of various agencies involved in search and rescue operation.

iv. To report and advise the Disaster Management and Relief Committee at their respective level.

2.5. Special Malaysia Disaster Assistance And Rescue Team (SMART)

SMART was established in 1995 as directed by the NSC Directive No. 19. SMART is directly responsible to the Director, Crisis and Disaster Management Unit, NSD. SMART comprises of 85 officers and personnel from the Fire and Rescue Department, Royal Malaysia Police and The Armed Forces. The Team is equipped with specialised skills and equipments to respond to any search and rescue operation in any major disaster on land which is beyond the capabilities of the existing principal emergency services Search and Rescue (SAR) teams. The team members were trained in SAR training institutions abroad such as the USA, Sweden, Australia and Singapore. The decision on the

mobilisation and the deployment of the SMART team is made by the Director, General of the NSD or the Director, Crisis and Disaster Management Unit.

2.6. The Role Of The Malaysian Meteorological Service In Disaster Management

The Malaysian Meteorological Service (MMS) is the agency responsible to provide information and warning occurrences adverse weather phenomena to the general public through the mass media or to other government agencies directly involved in disaster mitigation. A Central Forecasting Office has been established in the Meteorological. Headquarters to monitor closely the weather and sea conditions over the Malaysian region. Special emphasis was given to the following:

i. Heavy Rainfall

Prolonged widespread heavy rainfall are often experienced in the east coast of Peninsular Malaysia, Sabah and Sarawak during the Northeast Monsoon season from November to January causing floods in low lying area. The MMS monitors the weather and issues advisories and warnings regarding impending occurrence of heavy rain spells to the Department of Irrigation and Drainage, the National Security Council as well as the State Operations Rooms.

ii. Strong Wind and Heavy Rainfall Associated With Tropical Storms

Although Malaysia is not directly affected by the destructive forces of typhoons, however the northern part of the country especially Sabah experience the strong wind associated with tail effect of typhoons and tropical storms in the West Pacific Ocean and South China Sea areas. On very rare occasions, the northern part of the country is directly hit by tropical storms. Tropical storm ?Greg? which hit Sabah on Christmas eve of 1996 brought heavy rain and strong wind which claimed 238 lives . Hence, the MMS monitors the formation of tropical storms in the Malaysian region very closely to ensure that adequate warning can be given to potential victims so as to reduce the adverse impact of these devastating storms.

iii. Strong Wind And High Waves

The MMS also continuously monitors the sea conditions and issues warnings of strong wind and high waves over Malaysian territorial waters to vessels and oil rigs operating in the area.

iv. Intense Haze Episodes

The MMS works very closely with ASEAN specialised Meteorological Centre in Singapore to monitor and issue long range forecast for the ASEAN region, with special emphasis on the drought condition affecting the region by the El Nino phenomena. MMS also monitors the occurrences of local and cross-boundary haze in the country and provides meteorological information, including satellite pictures depicting locations of forest fires, to the various government agencies involve in the prevention, monitoring

and remedial measures to combat haze caused by open burning, forest fires and other sources of smoke.

v. Drought

The 1997/98 El Nino had caused very significant reduction in rainfall from January to April in Sabah, northern Sarawak and Peninsular Malaysia. Besides monitoring the drought conditions, the MMS also conducts cloud seeding as an attempt to induce rains and to increase the water levels in dams in the affected area.

2.7. Roles And Functions Of The Drainage And Irrigation Department Of Malaysia (DID)

2.7.1. Flood

Flood is the most severe natural disaster in Malaysia from the perspective of area extent, population affected and economic impact. The National Water Resources Study (1982) estimated that some 29,000 sq. Km (9% of the total land area) were flood prone and more than 2.7 million people (18%) were affected. The average flood damage was estimated at RM100 million at 1995 price.

2.7.2. Flood Control Measures

After the disastrous flood of 1971 which affected many areas in Malaysia, various strategies and measures have been implemented by the Government to mitigate flood impacts. Such strategies include:

i. Establishment of the Permanent Flood Control Commission in December 1971 to implement flood control measures in order to reduce flood occurrence and to minimise flood damages in the events of flood.

ii. Establishment of the Natural Disaster Relief Committee in 1972 with the task to coordinate flood relief operations at federal, state and district levels. (The Committee was replaced by the National Disaster Management and Relief Committee in 1997).

iii. Implementation of structural flood mitigation measures.

iv. Provision of flood forecasting and warning services to river basins experiencing frequent floods.

Since 1971, the Drainage and Irrigation Department of Malaysia (DID) has been designated with task to implement structural flood mitigation works. Flood mitigation plans have been developed for 17 major river basins and 27 towns. Based on these plans, various structural and non-structural measures have been proposed and partially implemented. Such measures include improving river channel sections, building of flood bunds, levees, ring bunds, by-pass flood ways, use of mining pools for flood attenuation and construction of flood retention dams to regulate flood flows and minimise flood occurrence.

2.7.3. Flood Forecasting And Warning Services (FFW)

i. Telemetry System

DID is directly involved in the collection and analysis of real-time river water level and rainfall data for flood forecasting and warning operation during the flood season. To date, a total of 72 rainfall and 89 water level telemetric stations have been installed by the DID in river basins for FFW purpose. The telemetry data are transmitted through VHF Radio, telephone or satellite. Similar systems are being implemented for another 10 river basins under the Seventh Malaysia Plan (1966 - 2000). Presently real time flood forecast are issued for 7 river basins by the DID state offices during the flood season. The forecast river levels have greatly enhanced relief operations and evacuation during flood period.

ii. Manual Flood Level Monitoring

In addition to the telemetric stations, a total of 137 manual flood level monitoring stations have been set up at strategic locations in the country to monitor the river level on a real-time basis during the flood period. Whenever a river level exceeds a predetermined critical level, the local observer shall transmit continuously real-time water level information to the DID state office via telephone or VHF radio equipment. These information are further transmitted to the flood operation rooms at the district, state or federal level for flood relief operation.

iii Flood Warning Sirens

In river basins, which are subject to flash flood, little lead time is available for effective warning. Therefore, a total of 60 flood warning sirens, which automatically trigger once the flood level reaches a critical point, have been installed at strategic locations along such rivers. These warning sirens are especially useful when flash floods occur at night.

iv. Flood Warning Boards

A total of 60 flood warning boards have been installed in flood prone areas in the major river basins. Levels marked on these warning boards are correlated to the levels at the observation points upstream. The residents of the villages are able to assess for themselves the impending flood situation in their areas based on real-time upstream river and the forecast levels shown at the warning boards.

2.7.4. Drought

Hydrology and irrigation are two the main functions of DID. During a drought situation, a task force will be set up by the DID to monitor and evaluate the drought situation at padi growing areas in the country.

Based on analysis of rainfall, river levels and discharge data, various measures have been implemented to reduce the impact of water deficit on padi production.

2.8. Role And Functions Of The Social Welfare Department In Disaster Management

Under the NSC Directive No. 20 on Policy and Mechanism of Disaster Management and Relief, the Social Welfare Department has four main functions. These functions, which are related to Relief and Rehabilitation activities, are as follows:

i. The provision and management of relief/evacuation centres and forward-supply base.

- In Malaysia, there are a total of 3,417 designated relief/ evacuation centres, which can accommodate 943,000 evacuees, and a total of 348 forward-supply bases.

ii. The provision and distribution of relief assistance, which includes food, clothing and other essential items to the affected victims.

iii. The registration of disaster victims for purposes of rehabilitation.

iv. To provision of ?post-trauma? counselling services to the affected victims.

v. In practice, the Social Welfare Department, being a member of the National Disaster Management and Relief Committee, will play its role before, during and after the occurrence of disasters.

vi. The Preparedness Stage

- To identify the locations of Relief/Evacuation Centres and Forward Supply Bases especially in the flood prone areas.

- To update the list of names of officials, who need to be contacted and mobilised in the event of any disaster (their addresses and telephone numbers).

- To identify the names of Suppliers/Agencies who will supply relief assistance, namely food stuffs (dry and wet rations) and other necessities.

- To update the Operation Rooms.

- To set up the corp of Volunteers/Task Force, comprising members of the Premier Welfare Brigade and other voluntary organization.

- To prepare duty lists for the officials and volunteers.

- To provide training courses for the officials and volunteers in disaster management work.

- To send dry rations to forward-supply bases, prior to the event of a disaster.

vi. Response Stage

- To register the affected victims/evacuees.

- To manage the relief/evacuation centres and forward-supply bases.

- To distribute food supplies and other necessities.

- To mobilize the volunteers/task force to help in registration and food distribution works.

- To organize suitable activities for the evacuees in the relief/ evacuation centres.

- To provide ?post-trauma? counselling services to victims suffering from stress, depressions, etc.

vii. Recover / Restoration Stage

- To evaluate the damage involved, including the damage o houses, crops and livestock.

- To propose and draw up appropriate rehabilitation programmes/plan.

- To provide ?short-term? and ?long-term? relief/aid from the existing financial aid schemes.

2.9. Relief Assistance Schemes

Relief assistance schemes include the following:

i. Short-Term Schemes

- To provide food and temporary shelter.

- To give compensation to victims, either to repair or rebuild their houses.

ii. Long-Term Schemes

- To provide monthly financial assistance.

- To give launching grants.

- To give compensation for the loss of crops and livestock.

2.10. Landslides

Besides flooding, Malaysia is occasionally subjected to landslides. Just as flooding, landslides inflict a heavy toll on human life and property. Described as an abrupt and short-lived geomorphic erosion process, landslides can be attributed to the internal properties of earth materials, the geomorphic setting, and independent external factors that influence the stability of slopes. In addition,

excessive precipitation and human activities have contributed to slope instability and set the stage for landsliding.

Of late, Malaysia had experienced two major landslides. Farming activities involving indiscriminate clearing of land, coupled with continuous downpours, were partly blamed for landslides in Cameron Highlands over four days from 4th - 7th December 1994 resulting in the death of 7 people. Another landslide on 30th June 1995, took place about 39 km from the capital city of Kuala Lumpur. The site of the tragic incident was a slip road leading to the Genting Highlands resorts. Part of the hill came crashing down as flood waters washed tons of earth and fallen trees down the hilly slope. About a dozen or so vehicles including cars, buses and vans which were on their way to Genting Highlands, were swept down. 21 people loss their lives, while 22 other were injured. The exact cause of the landslide has not been fully determined yet.

2.11. Landslide Reduction Measures

In spite of the growing geologic understanding of the landslide processes and a rapidly improving engineering capability for landslide control, losses and casualties caused by landslides are on the increase. This is partly a consequence of residential and commercial development activities that are carried out on steep sloping terrain that is prone to landslip. In order to control and reduce the impact of landslides, the Government has undertaken legislative and non-legislative measures such as:

- identification and mapping of landslides prone areas;

- adaptation of landuse regulation in landslip-prone areas;

- development of design and building codes that will ensure the construction practices appropriate to the maintenance or enhancement of slope stability;

- amendments to Land Conservation Act 1960 to enable the government to have a comprehensive monitoring of development activities on hillslopes; and

- amendments to Environmental Impact Assessment (EIA) Rules 1987. This is to enable the government to have a closer monitoring and enforcement over development projects on hilly areas for the construction of roads, buildings and recreational facilities.

2.12. Public Education And Awareness On Disaster Reduction

In order to enhance disaster preparedness, the Malaysian Government has continuously carried out public education on disaster prevention to the people living in flood prone areas with the ultimate objective of protecting of human lives and property, as well as avoiding or minimising social disruption and economic losses. Public education and awareness programmes are carried out through the various media including TV and radio broadcast, aimed at enhancing public awareness of the dangers of natural disasters. Civic education and practical training in life saving techniques are also conducted in the natural disaster prone areas. In addition, presentations on life-saving during floods have been made and pamphlets on disaster prevention targeted at children in flood prone areas during the monsoon season were also circulated.

Agencies such the Malaysian Red Crescent Society and Civil Defence Department have also played their part in educating the public especially children on how to protect themselves against floods. Therefore, public education and awareness on disaster reduction in Malaysia is aimed at creating a higher level of community awareness including the ability of putting into place appropriate emergency measures, so that they could withstand the impact of natural disasters and prepare for and survive disasters.

2.13. Forest Fire And Severe Haze

The northern region of Sarawak and the western part of Sabah in Malaysia have been experiencing severe drought since late December 1997 that has been brought about by the El Nino phenomenon. The drought has brought about incidences of bush fires, mainly within the vicinity of Miri, Lawas, Limbang and Marudi in Sarawak and Sipitang in Sabah. In Miri, bush fire occurred in the dry peat areas during the first week of February 1998. The fires spread over a total area of more than 3,000 hectares. In Lawas, bush fire occurred in peat areas covering a total area of 1,000 hectares. A few incidences of bush fires covering approximately 70 hectares were also detected during March - April period in the State of Pahang in Peninsular Malaysia. The smoke from these peat and forest fires had resulted in severe haze episodes, especially in northern Sarawak, western Sabah, Peninsular Malaysia, Singapore, Brunei and to some event, southern Thailand.

2.14. Actions To Combat Forest Fire And Haze

To combat the forest fire and haze problem, the Malaysia Government implemented the following measures:

- Activate the National Haze Action Plan.

- Activate an operation centre to coordinate the activities to combat haze and forest fires.

- Mobilize fire-fighting personnel from the Fire Services and Rescue Department to fight fires on ground, equipped with specialized fire-fighting equipment.

- Mobilize the Army, Police and Local Authorities personnel to assist the Fire Services and Rescue Department in the fire fighting.

- Undertake aerial water bombing of area of forest fire.

- Institute legal action against offenders of open burning in plantations.

- Carry out air surveillance to detect bush fires.

3. International Cooperation

3.1. Memorandum Of Understanding Between Malaysia and Indonesia

Malaysia and Indonesia signed a memorandum of understanding (MoU) on Disaster Cooperation and Assistance on 11 December 1997 allowing the two countries to work together to manage and handle any forms of disaster that may occur. The MoU on Disaster Cooperation and Assistance was signed by H.E. Datuk Seri Mohamed bin Rahmat, who is the National Disaster Management and Relief Committee Chairman as well as the Minister of Information, on behalf of the Malaysian Government and H.E. Dato? Seri Utama Ir. Azwar Anas, Coordinating Minister for People?s Welfare and also Chairman of the Indonesia National Disaster Management Coordinating Board (BAKORNAS-PB) on behalf of the Indonesian Government.

The initial objective of the MoU was for Malaysia and Indonesia to jointly tackle the haze problem, but the two countries had decided to include other areas of disaster management and assistance.

Under the MoU, both countries had agreed to the followings:

i. Exchange of expertise and information on the latest technology related to disaster prevention, risk reduction, response, mitigation, recovery and rehabilitation including teledetection. This also includes technology on detection by satellites, data interpretation and rescue operations in collapsed buildings or structures.

ii. Training of officers and personnel in disaster management, the concept of aeromobility emergency services (including the use of heliborne technique) and search and rescue techniques both on land and sea.

iii. Sharing of experience through seminars, conferences and publications on disaster management.

iv. Collaboration on public health studies related to the effects of particular disasters.

3.2. Agreement Between The Government Of Malaysia And the Government Of The French Republic On Co-Operation For Disaster Prevention And Management And Public Safety

The agreement was signed on May 25, 1998 in Paris, France by H.E. Datuk Seri Mohamed bin Rahmat, Chairman of National Disaster Management and Relief Committee on behalf of Malaysia and H.E. Mr. Jean-Pierre Chevenement, Minister of Interior, France on behalf of the French Government.

For Malaysia, this is the first time that such an agreement between the Government of Malaysia and the French Government is ever held on disaster management and cooperation. The agreement would be the basis for bilateral cooperation which could paved the way for closer and wider scope in disaster management including prevention, mitigation, assistance, expertise, training and exercises. In extending the cooperation, the French Government has assisted Malaysia in training five (5) Malaysian officers in late 1998 in France. The training

covered management of forest fire as well as technique of forest fire fighting.

The parties agree to develop co-operation in the fields of forecasting, prevention, assessment and management of natural, man-made and technological disaster situations by:

exchanging experts and specialists in the field of application of advanced technologies relating to natural, man-made and technological disasters or major incidents, including the use of satellite remote sensing, Geographic Information Systems (GIS), Satellite Based Positioning (SBP) Technology, spatial data analysis and modelling, and risk assessment;

initiating training activities for personnel involved in emergency response and disaster or major incidents, management, calculation of risk index and satellite data processing and interpretation and development of disasters early warning system through satellite remote sensing technology. This includes the deployment of transportable satellite data reception facility to enable effective monitoring of disasters such as forest fires, oil spills and waste discharge;

sharing their public health experiences, especially with regard to chemical, industrial and environmental hazards;

exchanging information on each country?s laws and regulations pertaining to environment pollution and hazards;

exchanging technology and scientific information relating to natural, man-made and technological disasters or major incidents through electronic media, forum and publications; and

participation of specialists of one party in the relevant national technical training programmes of the other party.

3.3. DISTRESS 1/97" - Joint SMART And DART Rescue Exercise

The first joint rescue exercise involving two elite rescue teams, the Special Malaysia Disaster Assistance and Rescue Team (SMART) and Disaster Assistance and Rescue Team (DART) of Singapore Civil Defence Force (SCDF), was held in Genting Highlands, Malaysia on 25 - 26 November 1997. The joint exercise codename ?DISTRESS 1/97″ was based on the scenario of a collapse of an apartment at the hillslope of Genting Highlands due to a landslide, resulting in about 40 occupants being trapped. SMART and DART were given the task of handling complicated rescue problems in this major simulated disaster. The district disaster management elements and the local rescue and emergency relief agencies such as Royal Malaysia Police, Fire and Rescue Department, The Malaysian Armed Forces, Medical Emergency Response Team, Civil Defence Department and The Malaysian Red Crescent Society were involved at a minimal level. 35 DART and 26 SMART rescuers were involved in the joint exercise.

The joint exercise was to promote better teamwork, proficiency and exchange of experience among SMART and DART members. The exercise also helped to verify and evaluate the preparedness of SMART and DART in conducting specialized search and rescue operations and promote a better understanding of each other?s operational concepts. The joint exercise was officially opened on 25 November 1997 by H.E. Datuk Seri Mohamed bin Rahmat, Malaysia Minister of Information and also the Chairman of the Malaysia National Disaster Management and Relief Committee.

In order to further strengthen the existing close cooperation and goodwill between the two elite rescue teams of Malaysia and Singapore, both countries agreed in principle to have a Memorandum of Understanding (MoU) on Disaster Management and Assistance. Perhaps the joint exercise and the proposed MoU could be used as a basis to pave the way for similar cooperations in disaster management among ASEAN members countries in the future.

3.4. Cooperation Between Malaysia And Brunei On Forest Fire Fighting

Malaysia and Brunei have agreed on 1 April 1998 to cooperate and help each other in fighting the forest fires at the Sarawak - Brunei border. Both countries have pledged to cooperate and exchange experience in fire fighting technique at the border areas.

In principle, both countries have agreed to cooperate in conducting cloud seeding and water bombing operations on areas affected by drought, haze and forest fires, particularly at the border areas of both countries. In addition, exchange of information of weather and air quality indices will be intensified. Malaysia also allows Brunei fire fighters to use water from the Limbang River in Sarawak for forest fire fighting operation. Thus this cooperation between the two countries is a positive step towards addressing effectively future haze problems prevailing in the border areas of Sarawak and Brunei.

3.5. Sub-Regional Fire Fighting Arrangements (SRFAs)

During the Third ASEAN Environment Ministerial Meeting on Haze held on 4 April 1998 in Bandar Seri Begawan, Brunei Darussalam, it was agreed that Sub-Regional Fire Fighting Arrangements (SRFAs) are to be established for Kalimantan and Sumatera/Riau provinces. The SRFAs would ensure at all cost that fires are prevented from becoming an economic and environmental threat in Sumatera and Riau provinces, and that fires in East Kalimantan must be contained and not allowed to spread to Central and West Kalimantan. The SRFAs will incorporate mechanisms to rapidly activate and mobilise efforts to put out fires before they get out of control, and to manage additional and complementary resources from within and outside the region. In this regard, Malaysia was given the task of fire-fighting coordination. Malaysia is to work out procedures to activate, mobilise and channel fire-fighting resources to target sites.

4. FUTURE REQUIREMENTS FOR DISASTER REDUCTION

4.1. Risk and Vulnerability Analysis

Such analysis should be mandatory in the appraisal of all development projects. Pilot risk mapping projects and hazard and vulnerability analysis should be conducted at the micro-level using where appropriate, Geographic Information System (GIS) and Remote Sensing (RS) technology.

4.2. Non-Structural Mitigation Measures

i. Disaster Management System

The need to strengthen national disaster management organisational structures and support them with sound administrative, financial arrangements and assets mobilisation.

ii. Training

To increase in training activities in the country through international support and cooperation by multilateral and bilateral organisation, NGO?s and others. Also to undertake training programmes for core disasters management personnel as well as supporting personnel in order to enhance disaster coordination and response.

iii. Public Awareness

The need for more sustained public awareness programs directed at local communities in disaster prone areas through international cooperation and assistance.

iv. Forecasting And Warning Systems

The need to improve in the methods and technology of warning system for flood, landslides and forest fire.

v. Hazard Mapping

The need to improve hazard mapping at macro and micro level.

4.3. Structural Mitigation Measures

The need to implement structural mitigation measures in both engineered and non-engineered structures, such as landslide control measures, river embankments and etc. International cooperation in the transfer of knowledge and expertise in the structural measures could greatly improve disaster reduction system in the country.

International assistance in improving disaster reduction system by integrating disaster reduction measures in disaster prone areas could reduce, the loss, damage and economic disruption caused by natural disasters in the country.

5. CONCLUSION

Policy makers as well as disaster and development experts recognise that each nation?s ability to achieve sustainable economic development can be increased by reducing the impact of disasters. Therefore, Malaysia is integrating disaster reduction in its international cooperation through enhancing regional cooperation in all aspects of disaster management, including, prevention, mitigation, preparedness, response and recovery, through more effective mutual assistance activities, in order to minimise the adverse consequences of disasters on the economic and social development internally.

Much has been accomplished within Malaysia in terms of disaster reduction since the onset of the International Decade For The Natural Disaster Reduction (IDNDR). In the spirit of IDNDR, which seeks to support sustainable economic development, natural hazard risk assessment, mitigation and warnings must be embedded in Malaysia?s development plans and process.

Except for flooding and occasional occurrences of landslides, Malaysia is relatively not affected by other major natural disasters. However, our involvement in IDNDR is significant through our participation in a concerted international action aimed at reducing the impact of natural disasters in the Asian region. As a member of the UN, Malaysia fully supports and participates in the UN?s efforts in the reduction of natural disaster by observing the UN sponsored International Day for Natural Disaster Reduction on October 13th, aimed at enhancing public awareness on the effect of natural disasters and undertaking various activities towards reducing natural disasters. In this respect, Malaysia is advancing its mission in national disaster management through effective coordination and integrated approach in the building of a Culture of Prevention and Civil Protection/Public Safety in the community. Thus, Malaysia hopes to create a safe environment for the community through Disaster Management, sustainable development and risk reduction in the 21st century.

Prepared by :

Crisis And Disaster Management Unit

Division For National Security

Prime Minister?s Department

Kuala Lumpur

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