

Country Report
Of the Government of the Union of Myanmar,
Ministry of Social welfare,Relief & Resettlement.

Asian Natural Disaster Reduction Conference
Kobe, Japan
(17-18 December, 1995)

1. The union of Myanmar lies in Southeast Asia and part of Indochina peninsula, having a long coastal line on the Bay of Bengal. The land area is about 676,552 sq-km and its coastal line is 2,276 km long. Its population is about 44.74 million.

2. **Hazards review**

2.1 Annually, Myanmar is suffering from the impacts of disasters caused by one or more major incidents. The common type of disasters, experienced in Myanmar as follows;

- (a) Fire
- (b) Storm(Cyclonic storm)
- (c) Flood
- (d) Earthquake (Tectonic earthquake)
- (e) Landslide

2.2 Among the above mentioned type of disasters, Fire is an annual menace and the most frequent in Myanmar. During the (5) years period from 1990-91 to 1994-95 Fiscal year, disasters occurred in the country, of which 67% Fires, 10%Flood, 14% Storm and remaining were other disasters.Landslide and earthquake sometime occur in hilly region-northwestern, northern and eastern parts of the country but these locations are remote areas and sparsely populated. Such disasters are negligible when compared with the above mentioned disasters, causing lives loss

and property damages. Disasters in Myanmar and provided relief assistance to disaster victims 1990-1991 to 1994-1995 Fiscal year see Annex (A).

3. National Disaster Organization

3.1 In order to effectively carry out disaster relief measures, the Committees for Natural Disaster Prevention, Preparedness and Resettlement were formed at different levels in 1985, comprising Minister for Social welfare, Relief and Resettlement. Deputy Ministers, Director-Generals and Managing Directors from respective Ministries:

- (a) Central Committee
- (b) Ad-hoc Committee
- (c) State and Divisional Committees
- (d) District and Township Committees

3.2 When take immediate measures any disasters strikes in the country, the relief and resettlement Department for disaster relief work with the co-operation of local authorities concerned and voluntary organizations such as regional Union Solidarity and Development Association, Red Cross Society and regional reserve force of Fire Service Brigade.

3.3 For pre-disaster planning, the respective regional Disaster Prevention, Preparedness and Resettlement Committees have programme for disaster prevention and preparedness according to the situation and geographical conditions of the region. It is now becoming practice to form a special committees comprising of the personnels from various departments concerned and representatives from the social voluntary organizations to implement pre-to-post disaster activities.

4. Warehouses for Immediate Relief

The Department of Relief and Resettlement establish warehouses in major cities of State and Divisions for the speedy despatch of relief goods to disaster stricken areas. There are 18-warehouses in the State and Divisions and store relief goods such as household items clothing, tarpaulin sheets for temporary shelter, fresh water tanks (collapsible Tanks) and generators to be at hand for emergency use in case of disaster. (Warehouses Location See Annex-B)

5. Disaster Reduction Measures in Myanmar

5.1 Disaster reduction plans

5.1(a) Department of Relief and Resettlement have in co-operation with the Department of Health, Meteorology and Hydrology Dept., Fire Service Dept., Human Settlement and Housing Development Dept., Irrigation Dept., and Myanmar Red Cross Society in the field of disaster prevention and reduction measures.

5.1(b) Fire hazard is the most threatening one in Myanmar, especially in Upper region. This region is situated in Dry Zone with less rainfall. In rural areas, most houses are constructed by the locally available raw materials such as bamboo, mangrove and thatch. So these conditions are added to outbreak fire hazard and the most outbreaking firehazards are due to the negligence of local residents. previously, the Human Settlement and Housing Development Department has been involved in post-disaster activities such as providing rehabilitation plans, resettlement and redevelopment schemes for those areas stricken by disaster. In doing so, mitigation of the disasters in future was to be achieved through physical planning. Some of the examples are Myeik and Meiktila Fires. Recently, the emphasis has been changed to predisaster management and disaster mitigation. After it has been identified that the main causes of fire outbreak are due to unplanned development and use of inflammable construction materials. The Department has undertaken the task of physical planning to prevent losses to potential disasters and has also established low cost building materials development unit to develop nonflammable building materials with indigenous raw materials. Systematic establishing new towns in accordance with the townplan is another plan to reduce fire hazards. Very recent fire in Bago, "From cottage to apartment system" is being implemented with the fund of public donation and allocation of the Government.

5.1(c) The second most frequent hazards are cyclonic storm and floods. Having a long coastal line along the western part of the country, Bay of Bengal is regarded as cyclone vulnerable area. Being a heavy rainfall country suffer flood disaster in mid-monsoon period of August to October. As long-term prevention and preparedness plan for cyclone and storm surge, (8) earthen high-mounds (embankments) which consists of refuge shelters and drinking water ponds were

constructed in Pauk-taw, Myebon and Minbya Township in Rakhine State, cyclone prone areas. During the cyclone season (April, May, June, October, November), Local populace can take refuge in these highmounds and shelters in case of emergency to avoid from storm surge, and strong wind. Department of Meteorology and Hydrology, is responsible for improving cyclone and flood warning and forecasting system. Hence, broad disseminations of warning are being made through the mass media such as television, radio, wireless and newspapers.

5.2 Educative Measure for Public Awareness

The Relief and Resettlement Department (RRD) has been conducting State and Division Level short-term Disaster Management Courses for the public education and awareness on natural disaster reduction with the co-operation of other departments concerned such as Meteorology and Hydrology Department, Health Department, Irrigation Department, Myanmar Red Cross Society, Myanmar Police Force and Fire Service Department. The courses are, in fact, the training for trainers so that they have to organize and conduct sub-trainings in their regions. Lecturing subjects by RRD in these course are as follows:

- The aims of Disaster Management Course and definition of disaster.
- History of Disaster in Myanmar
- Disaster Administration
- Counter Disaster Plan
- Function of Relief and Resettlement.

Participating departments also gave talks on their respective sectors. During the Decade for Natural Disaster Reduction 14 training courses have been conducted in 9 cities from 1990 to 1995. Many more courses will continue to take place.

6. International Cooperation in Disaster Reduction

6.1 Myanmar is fully aware of the importance of international Co-operation in the field of disaster reduction activities, research, training and exchange of experience. Hence, Myanmar always avails itself of the opportunity to send officials to training courses, seminars, workshops and conferences abroad.

6.2 At the same time, Myanmar has hosted regional seminars and workshops in cooperation with international and regional Organization such as WMO, ESCAP,

UNDP.

6.3 Being a WMO/ESCAP panel member country, Department of Meteorology and Hydrology is participating in WMO/ESCAP Panel on Tropical Cyclone Project funded by WMO. Participating countries are Bangladesh, India, Maldives, Myanmar, Pakistan, Srilanka and Thailand. Department of Health has been formulating a plan of actions for flood preparedness, by the health sector emergency preparedness, response in Bago Division funded by WHO.

7. Conclusion

Unlike other countries around the world, Myanmar rarely encounter major disasters which involve heavy human death toll. Myanmar has her own share of natural disasters occasionally. Almost every year, my country is affected by natural disasters such as fires and floods. Needless to say, our first priority is to increase public awareness in disaster preparedness. The Ministry of Social Welfare, Relief and Resettlement, in cooperation with other relevant Ministries and departments, not only disseminates information and data but also issues forecasts and warnings on natural disasters, in a timely manner. At the same time, we are prepared with disaster management activities. With the guidance and support of the Government, measures are taken without delay for emergency evacuation and relief, health care, social welfare, rehabilitation and resettlement.

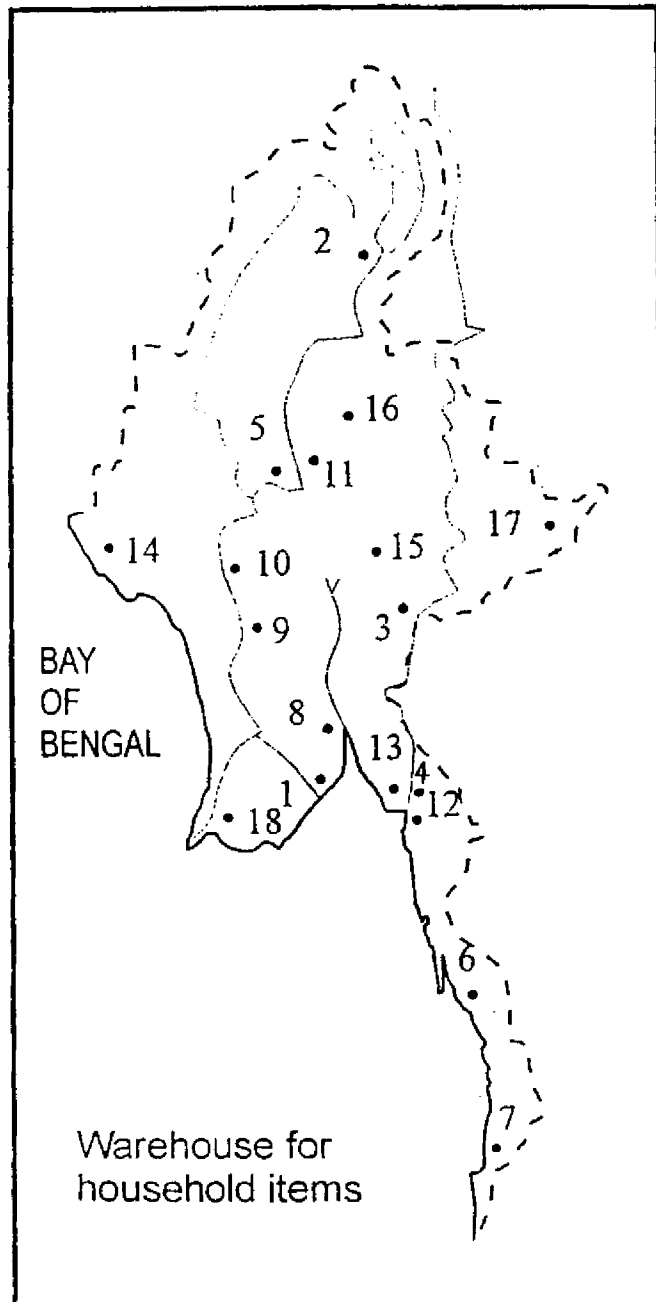
As mentioned earlier in this report, it is the outbreak of fires that brought losses to both the people and property. The common cause of fires is the negligence on the part of the people. Other natural disasters such as cyclones, floods and earthquakes happen less frequently than the fires.

The Relief and Resettlement Department, as the Focal Point for Myanmar, actively participates and carry out activities for natural disaster reduction. Seminars, workshops and modern telecommunications system would be helpful to achieve the goal of the International Decade for Natural Disaster Reduction.

**Disaster events in Myanmar and provided relief
assistance
(1990-91-1994-1995 Fiscal Year)**

| Sr No | Fiscal Year | Disaster events | | | | Affected Residents | Affected Family | No-s of victims | Losses (in million kyats) | Relief Provided amount(in million kyats) |
|----------|-------------|-----------------|-------|-------|-------|-----------------------|--------------------|--------------------|---------------------------------|------------------------------------------------------|
| | | Fire | Flood | Storm | Other | Total | | | | |
| 1 | 1990-91 | 313 | 42 | 59 | 52 | 466 | 30107 | 123731 | 285.76 | 12.29 |
| 2 | 1991-92 | 260 | 54 | 58 | 35 | 407 | 99789 | 233050 | 932.55 | 40.84 |
| 3 | 1992-93 | 265 | 29 | 81 | 32 | 407 | 27508 | 175383 | 383.62 | 35.10 |
| 4 | 1993-94 | 230 | 39 | 41 | 23 | 333 | 30307 | 159835 | 658.67 | 14.28 |
| 5 | 1994-95 | 259 | 29 | 38 | 38 | 364 | 48595 | 250237 | 291.53 | 15.99 |
| | Grand Total | 1327 | 193 | 277 | 180 | 1977 | 236306 | 942236 | 2552.13 | 118.50 |

Union of Myanmar



NATURAL DISASTER REDUCTION: NATIONAL RESPONSE AND INTERNATIONAL COOPERATION

INTRODUCTION

This is the report of the Philippines to the 1995 Asian Natural Disaster Reduction Conference. The information presented here follows the format requested by the conference organizers. It starts with a short background on the Philippine natural disaster situation. The next section tackles the Philippine national response to disaster reduction. Section 3 reviews the Philippine experience in international cooperation, with particular emphasis on Asian cooperation, in the field of natural disaster reduction. The report ends with prospects and recommendations for improved international cooperation.

The Philippine country report makes three key points. First, national disaster response is fundamentally adequate. Second, international cooperation in disaster reduction is an important element in strengthening national response. Third, further international cooperation can contribute substantially in further reducing the damage wrought by natural disasters.

1. Philippine Exposure to Natural Disasters

The Pacific Rim is not only a community of the fastest growing and most dynamic nations in the world. It is also the area exposed to a wide range of natural disasters. The Philippine archipelago, located near the western edge of the Pacific Ocean, is in the direct path of seasonal typhoons and monsoon rains which bring floods, storms, storm surges, and their attendant landslides and other forms of devastation. The Philippines also sits on the "ring of fire" where the continental plates collide and thus experience periodic earthquakes and volcanic eruptions. The Philippine exposure to

natural disasters may be characterized as frequent, varied, and severe; a combination which has made the country particularly attentive to disaster reduction.

A short inventory of recent natural disasters in the Philippines illustrates these terrible characteristics. The most frequent destructive natural phenomena afflicting the country are typhoons. In 1995 alone, 15 typhoons have already crossed the country as of this report, and 9 of them destroyed lives and property in their paths. The worst of these typhoons happened in November, tropical cyclone "Angela" known in the Philippines as "Typhoon Rosing". It adversely affected close to 900,000 families so severely that up to late November about 5,000 families remained in some 169 evacuation centers. This typhoon killed 883 persons, plus 188 still missing, and injured 1,925 more; destroyed about 200,000 houses; and damaged agricultural crops worth some P6 billion (\$240 million) and infrastructure facilities worth some P3 billion (\$120 million).

Earthquakes of destructive magnitudes have also hit the country. In 1995, an earthquake affected 398 families and destroyed P26 million (more than \$1million) worth of property in the south-eastern island of Samar. In 1994, a stronger earthquake rocked Mindoro island in Southern Luzon and killing 83 persons and causing property damage worth more than P500 million (\$20 million). An even stronger earthquake rocked Central and Northern Luzon, particularly Baguio City, in 1990 killing 1,283 people.

Volcanic eruptions have ravaged the country. In 1993, Mt. Mayon in the Bicol peninsula of Luzon island erupted and killed 80 people aside from displacing more than 100,000 people. The Mt. Pinatubo eruption in 1991, considered a disaster of global magnitude, killed 850 Filipinos, altered climatic conditions worldwide, and continues to reconfigure the terrain and landscape of the central plains of Luzon through the flows of lahar brought about by the eruption. The geological changes caused by this volcanic eruption continues to bring disasters in Central Luzon with every rainy season.

Floods and landslides have also hit the country. In 1995, floods and landslides affected the islands of Mindanao and Negros. In 1991, rampaging floodwaters hit

Ormoc City in the island of Leyte killing some 8,000 people and devastating 90% of the city.

In the first half of the 90's, natural disasters have hit the country with destructive force. This recent experience has made the Philippine society and government extremely sensitive to the challenge of disaster reduction.

2. The Philippine Response Towards Disaster Reduction

The Philippine response towards disaster reduction has been progressively developed and grown more extensive with every disaster the country has encountered. This report presents the many dimensions of this response in terms of four key aspects, namely: the institutional infrastructure for disaster management; the legal framework for disaster prevention and response; the national disaster management program; and the response to disasters by the civil society.

2.1 Institutional Infrastructure for Disaster Management

It is not an understatement to say that the total capacity of the Philippine government and society is the real foundation of national disaster management. The design of the institutional infrastructure for disaster management assumes that the country and its component communities will mobilize all its available institutions to protect lives and property and ensure collective survival in the face of natural disasters. Thus the basic Philippine law on disaster management, Presidential Decree (PD) 1566, promulgated in 1978, provides for the organization of multi-sectoral disaster coordinating councils at every level of government, from the national level to the barangay (or village) level. Through these disaster coordinating councils, which are able to link with all relevant government agencies and civic organizations, Philippine communities mobilize resources and capabilities needed to manage disasters.

The disaster coordinating council approach enables the country to utilize all available means for disaster response, means that are ordinarily used for military and police missions, public service or commercial purposes, but may be rapidly converted into disaster reduction capabilities. It also allows for routine cooperation, sharing of resources, and dissemination of information during periods of extreme stress and

emergencies. At the same time, the disaster management coordination approach provides for dedicated technical capabilities for specialized disaster management services as well as continuing attention to disaster preparedness.

At whatever scale of disaster, whether national, regional, provincial, municipal, village, or any levels in between, an appropriate disaster coordinating council is established, organized and trained to respond. The National Disaster Coordinating Council or NDCC, is the policy-making and coordinating body for disaster management at the national level. It directs all disaster preparedness planning, as well as disaster response operations and rehabilitation, both in the public as well as private sectors. It advises the President on matters related to natural calamities and disasters, including recommendations for the declaration of a state of calamity in disaster-affected areas. It is composed of the heads of fourteen national ministries, the Chief of Staff of the Armed Forces of the Philippines, the Secretary-General of the Philippine National Red Cross, and the Administrator of the Office of Civil Defense. The Defense Minister, or Secretary of National Defense, serves as the Chairman of the NDCC, with the Civil Defense Administrator as executive officer.

In each of the administrative regions of the country, including the autonomous regions, a regional disaster coordinating council performs similar functions as NDCC for the regions. Equivalent officials of various agencies at regional level serve in these councils which are headed by regional chairmen designated by the President.

In each local government of the province, city or municipality, the local disaster coordinating council is headed by the elected chief executive, such as the governor or mayor. In these local disaster coordinating councils, local as well as central government agencies operating at the local level cooperate with civic and non-government organizations under the leadership of the highest elected local official. Thus, disaster management is imbedded deeply into the democratic of governance of the Philippines.

2.2 Legal Framework for Disaster Prevention and Response

A set of laws and regulations have established the standards and safeguards essential for preventing damage and death due to disasters. The most important laws include following:

- a) PD 957 or The Subdivision Law, which regulate land developments for housing and commercial use;
- b) PD 1096 or The Building Code, which prescribes all pertinent requirements and standards for building structures;
- c) PD 1151 or The Environmental Policy Law, which protect natural endowments that serve as protection from erosion, strong winds and floods;
- d) PD 1185 or the Fire Code, which provides for fire prevention and protection measures;
- e) PD 1515 or the Watersheds Law, which provides for the preservation of natural watersheds and allowances for public easement in seas, rivers and lakes.

These laws and many others related to assuring the safety of life and properties as well as the protection natural buffers against disasters have been established. Occasionally, some failures in compliance have occurred. But by and large, these laws and their proper implementation have succeeded in providing a reasonable degree of protection to people and property in the event of disasters. Despite typhoons, earthquakes, volcanic eruptions and floods, the vast majority of man-made structures and communities have withstood the ravages of these disasters largely because of the prudent application of these laws.

2.3 The National Disaster Management Program

The Philippine disaster management program has a broad scope covering disaster preparedness, organization and training, construction of disaster reduction facilities.

disaster response and rehabilitation, public information, and research and development.

Disaster preparedness is an essential element of the disaster management program. Disaster management plans of key agencies and organizations have been prepared, reviewed and updated. These plans are properly documented and are regularly tested for continuing relevance.

Organization and training are continuing disaster preparedness tasks which are performed by the various disaster coordinating councils. Over the past few years, various emergency services necessary during disasters have been developed in all the regions and provinces. Designated organizations have been oriented in their various roles in disaster management. Local chief executives, particularly those elected to their posts for the first time, have been provided training on disaster management to equip them to effectively lead their local disaster coordinating councils. Specialized skills in search and rescue, evacuation, disaster medicine, vulnerability analysis, damage assessment and first-aid have been widely undertaken. In 1995 alone, 159 training sessions on various aspects of disaster management have been conducted all over the country.

Other disaster preparedness measures have also been undertaken such as disaster drills and exercises, and the establishment of disaster management operations centers. In the first half of the International Decade for Natural Disaster Reduction, the Philippines conducted 399 drills, with 85 of these conducted in 1995. Disaster management operations centers have been established with capabilities for a wide range of emergency services which include rescue, evacuation, emergency housing and relief services.

The Philippines has also devoted considerable resources to the construction and provision of disaster reduction facilities such as river dikes and sea walls, as well as non-structural measures like warning systems for typhoons, floods, tsunamis, volcanic eruption and lahar flows. Flood control projects and watershed management projects, in addition to the broader reforestation effort, are all geared to mitigate the worst effects of natural disasters.

In the event of disasters, plans and capabilities prepared beforehand are activated. The improved quality of planning, coordination and high state of preparedness have been responsible for a more rapid and comprehensive disaster response capabilities in various areas of the country. Volunteer workers with proper training, and reaction teams with proper equipment and skills have been invaluable in the disaster response effort. They have complemented the professionals in the various military and civil agencies of government as well as those in the private sector. In addition, the communications and warning capabilities of the government have also been augmented by the media organizations and the corporate communications capabilities of large Philippine enterprises. Together these resources have provided Philippine disaster response with a density and redundancy of capabilities which are the essential safety margins during disasters of uncertain and unexpected destructive force.

Public information before, during and after disasters is an important aspect of disaster management in the Philippines. Both through training and public education campaigns the disaster coordinating councils maintain and enhance public awareness of disaster reduction. Manuals and bulletins provided to media professionals help keep disaster preparedness in the public agenda. Special events like civil defense day, fire prevention month, disaster consciousness week, and the day for the international decade for natural disaster reduction help to mobilize civic consciousness.

Since the knowledge base of disaster management remains inadequate, the Philippines has also included research and development in disaster reduction techniques as part of its national disaster management program. Current priorities in this area include meteorological and hydrological disaster researches being conducted by the Philippine weather bureau (PAGASA) such as the tropical cyclone research on typhoon movement prediction, typhoon surface structure research, typhoon formation and intensification research and meteorological and hydrological hazard assessment. The Philippine Institute of Volcanology and Seismology (PHIVOLCS) is also conducting studies on the seismicity of Luzon and Visayas islands as well as the volcanic hazards of Mindanao island.

2.4 Response to Disaster by the Civil Society

Disaster response in the Philippines is truly a multi-sectoral and mass-based endeavor. A major contingent to the disaster management structure is composed of civic organizations, non-government organizations, people's organizations, and all forms of religious and social voluntary groupings. Partly because of their democratic political experience, the high public awareness of the destructiveness of disasters, and partly because the institutional framework for disaster management has encouraged it, popular participation of the Filipino people in disaster response is very broad, sustained, enthusiastic, organized and ultimately decisive.

Private organizations have filled gaps in the government response as well as augmented strained official capacities. These include services such as medical care, search and rescue, emergency housing and feeding, and many other needs. Initiatives in resource mobilization have allowed the country to tap aid from unaffected areas to flow to affected areas. Many social institutions like the Church, the schools, the media, and professional associations have become channels for popular participation in disaster management.

This broad response of the civil society provides the Philippine disaster response with a depth and strength gained only from the cruel lessons of recent disasters. This may be an important silver lining to the dark clouds of disasters which had threatened the nation.

3. Review of Current Cooperation in Disaster Reduction Among Asian Countries

While the Philippines has largely relied on its own resources to manage the disasters it had encountered, it has also benefited from tremendous international, and particularly Asian, cooperation in this field. The similarity in the types and severity of disaster exposure shared by Asian countries make cooperation among them particularly useful and important. For the Philippines, this cooperation has contributed to the rapid development of national and local disaster management capabilities.

The following are some examples of excellent international cooperation which the Philippines has experienced:

- a) In terms of strengthening the disaster-reduction organization and capabilities, the Philippines had benefited from international cooperation in the development of the flood forecasting and warning systems for three Luzon river basins; namely the Agno, Bicol and Cagayan river basins; and the installation of the lahar warning and monitoring systems at the Mt. Pinatubo and Mt. Mayon areas.
- b) In terms of transfer of technology and training in disaster reduction, the Philippines has benefited from international cooperation in such examples as training of Filipino experts in Japan on disaster prevention technology and administration, improving cyclone warning response, and aseismic engineering; in Thailand on disaster management at the Asian Disaster Preparedness Center; and in Australia on radiological emergencies.
- c) In terms of increasing awareness in disaster reduction, the Philippines has participated in such international conferences as the 1994 world conference on IDNDR; ASEAN experts meeting on disaster management; sessions of the Typhoon Committee.
- d) In terms of sharing relevant information, the Philippines has developed its own disaster information system; participated in networks for sharing weather satellite images and data communications to access UN-DHA and other international disaster organizations.
- e) In terms of receipt of disaster relief assistance, the Philippines has benefited from the generosity and kindness of many governments and nations. The extent of this foreign assistance is such that the Philippines has developed and implemented guidelines for the smooth and expeditious handling and receipt of food, clothing, medicines and equipment donated by foreign governments and civic organizations for disaster relief and rehabilitation. The Office of the President serves as the primary conduit for all these donations to be channeled to the affected communities.

The illustrative examples cited point to the catalyzing role of international cooperation. It brings new and added capabilities which may not have been fully developed yet in the country. And it also increases the benefits of sharing so that the benefactor as well as the recipient gain something from their cooperation. While international cooperation in disaster reduction has been extensive and gratifying thus far, there could be other areas of possible improvements in this field of international cooperation.

4. Prospects for Further International Cooperation

From the perspective of the Philippine disaster management experience, there are a number of areas which offer good prospects for international cooperation in disaster reduction.

- a) Strengthening collapsed building rescue capabilities: This specific area of disaster management is a priority area of the Philippines because of its high exposure to earthquake risks. While a Philippine task force trained and equipped for collapsed building rescue currently exists, its capabilities need to be strengthened and broadened in terms of advanced specialized training, equipment and more exposure to varied real-life rescue operations.
- b) Developing a national center for disaster research and training: In the light of the frequency, variety and severity of disasters in the Philippines, the government has seen the need for a specialized technical center for training and research in various aspects of disaster management. This center can specialize in those areas of concern to the Philippines and may be linked with other similar centers abroad.
- c) Mobilizing information technologies for disaster management: A broad class of information technologies such as geographic information systems, database management systems and other rapid analysis and presentation systems are currently available and useful for disaster management. The hardware, software and model uses of such technologies that can be made available to Philippine disaster management organizations will provide a tremendous boost its disaster preparedness and disaster reduction endeavors.

d) Systematic disaster capabilities planning: Current knowledge about the nature of disaster risks in various communities and areas of the Philippines could be matched by a set of appropriate disaster management capabilities that may need to be developed in those areas or communities. This could serve as the basis for upgrading current disaster preparedness plans. Such a systematic effort could be undertaken with international cooperation and a special support program so that a better matching of risks and capabilities is achieved.

These are just a few of the current priorities of Philippine disaster management authorities for possible international cooperation. Filipinos have learned that disasters do happen, but their destructive force can be mitigated with good planning, prompt action, and constant preparation. International cooperation and support has helped improve Philippine response in all these fronts. It is hoped that such cooperation will continue to be satisfying to all its participants, and that all nations gain by helping each other.

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COUNTRY REPORT ON DISASTER REDUCTION MEASURES

AIM

1. This report provides an overview of the Preparedness programme and activities undertaken by Singapore to prevent and manage disasters.

INTRODUCTION

2. The Republic of Singapore is a small island City State with a land area of about 600 square kilometres with a multi-racial population of about 2.9 million people. More than 80 percent of its population lives in about 4,700 high-rise apartment buildings in public housing estates. The republic also has hundreds of high-rise commercial buildings, some reaching a height of over 280 metres, mostly in its central business district.

3. Geographically, Singapore is just outside the 'Pacific Rim of Fire' and is thus spared from the ravages and destruction caused by natural phenomena such as earthquakes and volcanic eruptions. The republic nevertheless has from time to time, experienced some localised man-made disasters and major accidents, which also had painful and tragic consequences.

MAIN CONSIDERATIONS

4. The Emergency Preparedness Programmes and Disaster Management activities undertaken by Singapore are based on the following main principles:

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- a. Man-made disasters can be prevented, and their tragic consequences, minimised through a set of stringent and comprehensive government regulation on fire and building safety, coupled with strict enforcement.
- b. Emergency and contingency plans should be developed to deal with disasters should they occur. Such plans should also be tested and fine hone through regular exercises and drills.
- c. The community should be educated on the need for and importance of emergency preparedness. Where possible, they should also be involved in exercises, training and physical preparations.
- d. Emergency response and management of disasters should be a coordinated multi-agency effort. All available expertise and resources should be coordinated and swiftly channelled to the disaster site to maximise the chances of survival of the injured and to minimise damage to infrastructure.
- e. Restoration work and the rehabilitation of the injured should be an integral part of the total disaster management programme.

EMERGENCY AUTHORITIES

5. The Ministry of Home Affairs is the principle policy and directing authority responsible for civil defence emergency preparedness and disaster management. Under its command are two emergency agencies - the Singapore Civil Defence Force (SCDF) and the Singapore Police Force (SPF) which are responsible for planning,

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coordination and implementation of the various programme and activities. Several other Ministries, Statutory Boards and government departments are also involved in supporting roles (e.g. the Ministry of Health).

LEGISLATION

6. Singapore's Emergency Preparedness Programme and disaster management activities are supported by various laws. The main laws in this context are:

a. CIVIL DEFENCE ACT 1986

This Act provides the legal framework for, amongst other things, the declaration of a state of emergency and the deployment of national service rescuers to support the SCDF.

b. FIRE SAFETY ACT 1993

This Act provides the legal framework to impose fire safety requirements on commercial and industrial premises as well as the involvement of the management and owners of such premises in emergency preparedness against fires.

EMERGENCY PREPAREDNESS MEASURES

7. Singapore's Emergency Preparedness programme for major disasters comprised the following main elements:

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a. Plans

A multi-agency approach, coordinated by the SPF, was adopted for the development of emergency or contingency plans covering the following types of disasters:

- (1) Fires in high-rise commercial and residential buildings
- (2) Fires in petro-chemical installations and oil refineries
- (3) Release and spread of hazardous and toxic materials
- (4) Collapse of buildings and other major structures
- (5) Accidents involving land, air, sea and rail transport

b. Drills and Exercises

To ensure that the contingency plans are comprehensive and effective, drills and exercises are conducted by the various emergency authorities. Such exercises and drills also involve the owners and occupants of the building premises as well as the general public. An example is the weekly Monday Morning Fire Exercise conducted by the SCDF for various commercial high-rise buildings. In addition, the SCDF and the SPF conduct regular training exercises for its emergency response personnel to hone their operational readiness and capability.

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c. Public Awareness, Education & Participation

- (1) An effective emergency preparedness programme should involve the population. Since its inception in 1982, the SCDF has been implementing community relations programmes for emergency preparedness. The public is regularly kept informed and reminded on the need for and importance of emergency preparedness through various communications tools e.g. news and press advertisements, posters, leaflets etc. The underlying message to the public is "Readiness is Your Only Protection".
- (2) Public education programmes covering fire prevention and safety, evacuation, rescue, first-aid, etc. have been developed for different target groups. These target groups include children, housewives, senior citizens, schools, factories and commercial premises. The long term goal is to have at least one person in each household to be educated or trained in emergency preparedness.
- (3) An extensive community and grassroots network has also been established by the SCDF to promote civil defence and involve the population in emergency preparedness, especially exercises (e.g. water-rationing and blood collecting exercises).

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DISASTER MANAGEMENT AGENCIES

8. The following is an overview of the disaster management measures instituted in Singapore:

a. Main Agencies: SCDF AND SPF

- (1) The SCDF and the SPF are the main agencies responsible for on-site Disaster Management. The SCDF is responsible for the conduct of fire-fighting and rescue operations at the disaster site and the transportation of victims to hospitals for medical treatment. The SPF is the overall incident commander and is responsible for the security as well as co-ordination matters.
- (2) With a strength of about 100,000 personnel comprising 65,000 Operationally Ready National Servicemen (Reservists) and full-time National Servicemen, 43,000 volunteers and a core of about 1,500 regular officers and men, the SCDF responds to all types of emergencies round-the-clock. Its Rescue Battalions, each with about 600 National Servicemen, can be swiftly mobilised.

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- (3) Organised with a 3-tier structure, SCDF Headquarters command and control four territorial Divisional HQs which in turn manage the fire stations and other ground units. The fire stations will provide the first response. Depending on the scale and nature of the disaster, the fire stations are supported by the Rescue Battalions, the Division HQs and SCDF Headquarters.
- (4) The SCDF also has an elite rescue team, DART, which stands for the **Disaster Assistance and Rescue Team**, to carry out complex and difficult rescue operations, including tunnelling, MRT rescue and high-rise rescue. DART is equipped with state-of-the-art equipment, such as the Search cameras, Fibre-Optical scope, Thermal Imaging Camera, Trapped Person Locator and breathing apparatus.

b. Supporting agencies

In the management of disasters, the SPF and the SCDF are supported by other government agencies, coordinated by the SPF, viz the following:

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- (1) The Ministry of Health which is responsible for medical treatment of the injured; and physical and psychological rehabilitation of victims.
- (2) The Ministry of Community Development which is responsible for management of the homeless in relief centres.
- (3) The Ministry of Information and The Arts which is responsible for media relations and public information.
- (4) The Ministry of Environment which is responsible for disposal of the dead and cleaning up operations (e.g. debris disposal).
- (5) The Public Works Department which provides advice on engineering and structural safety.
- (6) The Public Utilities Board which is responsible for shutting down and diversion of power, gas and water supplies to facilitate the fire-fighting and rescue operations, and for their restoration after the disaster.

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INTERNATIONAL COOPERATION

9. Over the past years, Singapore was involved in the following areas in co-operation in disaster management:

a. International relations programme

Singapore has an on-going exchange programme with a number of countries from the Asia-Pacific and Europe. The various emergency authorities in Singapore, especially the Ministry of Home Affairs, the Singapore Civil Defence Force and the Singapore Police Force meet their respective foreign counterparts from time to time to exchange views and experiences on emergency preparedness and disaster management.

b. Overseas rescue assistance

The SCDF has since assisted the Philippines in the Baguio Earthquake rescue operation in 1990 and Malaysia in rescue operation in the collapse of the Highland Towers in Kuala Lumpur in 1993. This contingent is registered with the United Nations Disasters Reduction Organisation (UNDRO) as an International Search and Rescue Team.

c. Exchange of Training

The SCDF has provided assistance to some of its Asean neighbours in rescue and fire-fighting. Some examples include the training

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attachments for the Brunei fire services and training for the Special Malaysia Disaster Assistance and Rescue Teams (SMARTs). A number of SCDF's personnel were attached to the fire services of Japan and Hong Kong for training in order to benefit from the experiences of these countries.

CONCLUSION

10. Singapore values public safety and security. It believes in being prepared to face major disaster so as to ensure minimum disruption by any disaster to its community, environment and infrastructure. It garners all efforts to promote and institutionalise emergency preparedness among its people, while developing and exercising contingency plans for a range of foreseeable disasters to be executed by various emergency agencies in close co-ordination. Where appropriate, it also shares its experience and rescue resources to nearby countries in need of assistance.

9 December, 1995.