

ESCAP/UNDRO SYMPOSIUM  
on  
INTERNATIONAL DECADE FOR NATURAL DISASTER REDUCTION  
Bangkok, 11-15 February 1991

INDONESIA DISASTER PREPAREDNESS AND DISASTER MANAGEMENT

Jusuf Talib  
Secretary of the BAKORNAS PB

INTRODUCTION

The geologic and geographic setting of the Indonesian archipelago and the unequal distribution of population are continuing to plague Indonesia to variety of hazards to environment and infrastructural buildings and constructions, and settlements, which could caused suffering of peoples, damage and high monetary losses amounting to billions of rupiahs. The government of Indonesia is very concerned with disaster as they have tended to become more destructive affecting ever larger concentration of populations, by issuing of several regulations to prevent and mitigate the disaster impact.

The socio-economic development from agrarian to industrial concept is in fact imperative, although it has brought consequences in population mobility from the rural to the urban area, and socio-cultural changes, which could bring sociologic risks.

The recent implication of disaster management has made a great progress, especially with the application of science and technology in research and studies and assessment of disastrous phenomena and its management. It has reduced or minimized damage, losses and suffering of peoples.

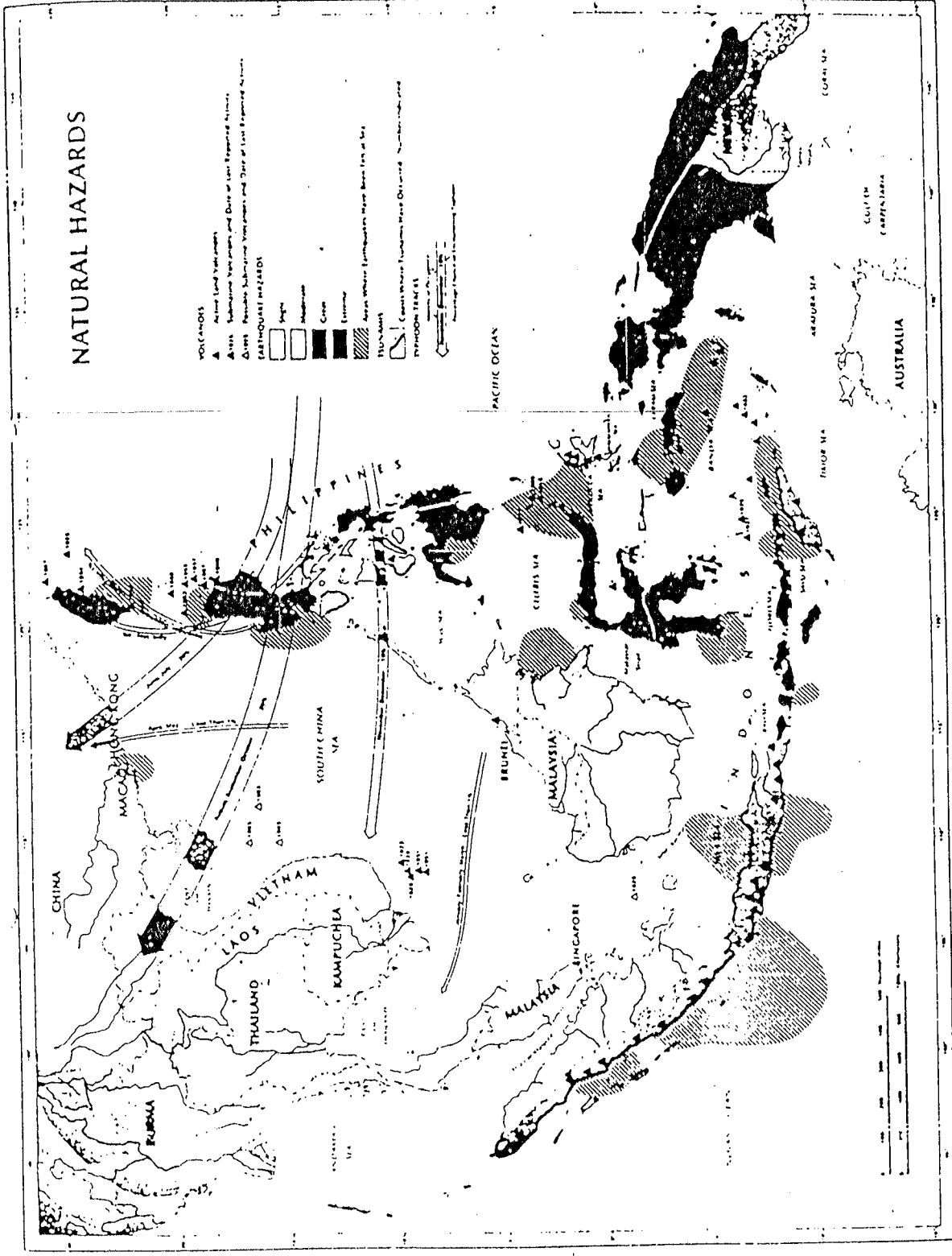
PHYSICAL CONDITION AND PROBLEMS

Physical Condition

Indonesian archipelago consists of five main islands and about thirty smaller groups totalling 13,677 islands and islets of which about 6,000 are inhabited and located

# NATURAL HAZARDS

- VOLECANOS**
- ▲ Active Land Volcanoes
  - △ Vol. Submarine Volcanoes and Out of Last Reported Name
  - Vol. Possible Submarine Volcanoes and Out of Last Reported Name
- EARTHQUAKE HAZARDS**
- Light
  - ▨ Moderate
  - ▩ Green
  - ▧ Extreme
  - ▦ Areas Where Earthquakes Have Been Reported
- Tsunami**
- ▧ Areas Where Tsunamis Have Occurred
  - ▦ Areas Where Tsunamis Have Been Reported
- PHOENIX TRENCH**
- ▧ Areas Where Tsunamis Have Occurred
  - ▦ Areas Where Tsunamis Have Been Reported
- Scale: 1:100,000,000



in tropical zone between the Pacific and the Indian Ocean, and bridges the two continents the Mainland Asia and Australia. Due to its geographic position the Indonesia's social, cultural, economical and political as well as its security patterns have always conditioned by this position.

The territory of the Republic of Indonesia stretches from 6°8' North latitude to 11°15' South latitude and from 94°45' to 141°65' East longitude, with estimated area about 5,193,250 square km, which consists of a land territory of 2,027,87 square km, and sea territory of 3,166,163 square km in size; Java, 132,187 square km, the most fertile and densely populated island; Kalimantan or twothird of the island Borneo measuring 539,460 square km; Sulawesi 189,216 square km and Irian Jaya 421,981 square km. The others are smaller in size.

The three seismic belt which divide Indonesia archipelago into three division, are the Alpine Java or Tethys mountain systems, -- stretching from the Mainland Asia southward, west of the island Sumatra and subsequently turning east, south of the island Java, towards the Moluccan islands --; the second belt is the Circum Pasific System, constituting a part of the east Asiatic Systems, -- stretching from the islands of Japan all the way down south through the Philippines, the northern part of Sulawesi and the Moluccan islands --, and the third belt is the Circum Australia Belt, constituting a part of the East Asiatic System, -- stretching from New Zealand through Australia, the province of Irian Jaya and the Moluccan islands.

Indonesia's land area is generally covered by thick tropical rain forest, where fertile soils are continuously replenished by volcanic eruption like that on the island of Java. Almost the ejected lava has a high degree of fertility. The island of Java has 35 volcanic centers of which 16 are categorised as type A volcanoes. There are in total 128 active and 75 type A volcanoes in Indonesia.

The climate and weather is characterised by an equatorial double rainy season. Its variation is caused by

the equatorial circulation (Walker Circulation) and the meridional circulation (Hardley Circulation). The displacement of the latter circulation is closely related to the north-south movement of the sun and its position at a certain period with regard to the earth and the continents of Asia and Australia. These factors contribute to the displacement and intensity of the Inter Tropical Convergence Zone (ITCZ) being an equatorial trough of low pressure. This characterises the weather of Indonesia while the prevalence of the west and the east monsoon (the rainy and dry seasons) are characterising the Indonesia's climate.

The population are numbering 179,321,641 with a decreasing of growth rate from 2.15 to 1.97 % (National Census of 1990). The largest number of population, approximately 61 % are living in Java which constitute an area of only 7 % of the whole land area, where 30.93 % crowding the urban areas. It adds even more to Indonesia's complexity.

#### Problems addressed

Under these circumstances according to its physical conditions Indonesia is subjected to an extremely high degree of seismic activity with an annual average of 350 earthquakes, where between 4 to 10 earthquakes are considerably formidable magnitudes. Approximately half to two third of the South East Asian total earthquakes have occurred in Indonesia.

Due to the 128 existing active volcanoes consequently Indonesia is subjected to a considerable earthquake incidence rate of volcanic nature. Active crustal movements along the Indonesia islands are the regions extending from Sumatra passing through Java and Lesser Sunda islands to the north following the western part of Sulawesi, which are are categorised as prone areas to earthquakes and volcanic eruptions.

Moreover the humid tropical climate of most regions in

the country receive very high annual precipitations, a condition of giving a risk factor for incidence of landslides and floods. According to historical records most of these disasters are striking at regular intervals due to recurrency of nature. Studies have been made to measure the destructive impact of disaster, and to improve the prediction and mitigation capability.

The socio-economic constraints arise due to the socio-cultural changes as a consequence of of the modernization of nature. Almost developing countries are facing this kind of cultural dilemma, especially within the transition from the agrarian to the economic industrial concept which have a different of employment opportunities. This condition produces new problems causing urbanization.

Disaster awareness is one of the important issues to make the peoples and the almost related officials to be aware and prepared facing all kind of hazards. It needs education and training, and providing appropriate logistical facilities in which context transportation and telecommunication facilities are the most constraints.

Humanitarian issues tend to dominate the rescue and relief activities and overwhelm the disaster preparedness. Continuous recurrency of disaster occurrences and several economic constraints tend to reduce the level at which mitigation procedures can seemingly be practised. The Government has taken the role in achieving the right balance between disaster relief and mitigation which has been exercised at the national level, and encouraged its implementation at all level of authority.

#### DISASTER PREPAREDNESS

Natural and man-made disaster threatening Indonesia are comprehensive and severe. Major risks arise from earthquakes, volcanic eruptions, floods, landslides, strong wind, high tide, fires, droughts, agricultural pests and

DROPPING UANG UNTUK PENANGGULANGAN BENCANA TAHUN 1983/84-1987/88

No	:PROVINSI:	1983/84	:	1984/85	:	1985/86	:	1986/87	:	1987/88	:	JUMLAH
1	:DI ACEH :	35.281.000,00	:	25.000.000,00	:	90.000.000,00	:	60.000.000,00	:	10.225.000,00	:	220.506.000,00
2	: SUMUT :	6.365.000,00	:	37.760.000,00	:	9.300.000,00	:	37.750.000,00	:	123.562.600,00	:	214.737.600,00
3	: SUMBAR :	7.500.000,00	:	3.940.000,00	:	12.000.000,00	:	0,00	:	547.223.000,00	:	570.663.000,00
4	: RIAU :	22.500.000,00	:	8.000.000,00	:	45.389.000,00	:	38.000.000,00	:	15.000.000,00	:	128.889.000,00
5	: JAMBI :	0,00	:	0,00	:	12.804.000,00	:	27.750.000,00	:	21.764.400,00	:	62.318.400,00
6	: SUMSEL :	5.000.000,00	:	0,00	:	20.000.000,00	:	10.700.000,00	:	0,00	:	35.700.000,00
7	: LAMPUNG :	0,00	:	6.000.000,00	:	1.700.000,00	:	184.425.000,00	:	4.545.500,00	:	176.670.500,00
8	: B KULU :	0,00	:	0,00	:	0,00	:	0,00	:	494.145.000,00	:	494.145.000,00
9	: KALBAR :	25.000.000,00	:	0,00	:	0,00	:	0,00	:	17.000.000,00	:	42.000.000,00
10	: KALTENG :	5.000.000,00	:	5.000.000,00	:	7.000.000,00	:	21.981.000,00	:	0,00	:	38.981.000,00
11	: KALSEL :	5.000.000,00	:	35.364.000,00	:	14.850.000,00	:	42.246.650,00	:	165.770.500,00	:	263.231.150,00
12	: KALTIM :	0,00	:	18.733.000,00	:	0,00	:	30.440.000,00	:	121.250.000,00	:	170.423.000,00
13	:DKI JAK :	12.500.000,00	:	219.175.000,00	:	33.250.000,00	:	11.434.900,00	:	14.515.100,00	:	290.875.000,00
14	: JABAR :	285.174.490,00	:	164.787.333,00	:	161.641.300,00	:	197.690.000,00	:	307.440.000,00	:	1.116.733.123,00
15	: JATENG :	108.600.000,00	:	112.802.750,00	:	135.252.225,00	:	239.573.400,00	:	191.750.000,00	:	787.978.375,00
16	:DI YOGYA :	10.000.000,00	:	750.000,00	:	11.550.000,00	:	0,00	:	70.000.000,00	:	92.300.000,00
17	: JATIM :	74.000.000,00	:	79.931.950,00	:	33.500.000,00	:	130.776.000,00	:	294.426.000,00	:	612.633.950,00
18	: SULUT :	6.000.000,00	:	11.700.000,00	:	0,00	:	57.500.000,00	:	0,00	:	75.200.000,00
19	:SULTENG :	163.500.000,00	:	0,00	:	0,00	:	0,00	:	0,00	:	163.500.000,00
20	: SULSEL :	40.000.000,00	:	0,00	:	5.000.000,00	:	34.000.000,00	:	114.217.200,00	:	193.217.200,00
21	: SULRA :	0,00	:	9.650.000,00	:	5.000.000,00	:	21.395.000,00	:	0,00	:	36.045.000,00
22	: BALI :	2.500.000,00	:	4.912.350,00	:	16.000.000,00	:	814.000,00	:	12.436.550,00	:	36.662.900,00
23	: N T B :	2.300.000,00	:	6.881.600,00	:	101.464.000,00	:	19.400.000,00	:	93.424.550,00	:	223.470.150,00
24	: N T T :	52.000.000,00	:	13.500.000,00	:	16.000.000,00	:	0,00	:	126.227.322,00	:	207.727.322,00
25	: MALUKU :	65.627.000,00	:	79.050.000,00	:	35.875.000,00	:	1.084.000,00	:	7.591.510,00	:	189.227.510,00
26	: IRJA :	65.250.000,00	:	65.000.000,00	:	10.000.000,00	:	15.000.000,00	:	20.000.000,00	:	175.250.000,00
27	: TINTIM :	0,00	:	61.657.387,00	:	72.400.000,00	:	0,00	:	0,00	:	134.057.387,00
JUMLAH :		999.097.490,00	:	769.595.370,00	:	849.975.525,00	:	1.161.959.950,00	:	2.772.514.232,00	:	6.753.142.567,00

diseases, water/air/soil pollutions, deforestations and other environmental degradations. Natural disasters have repeatedly caused significant economic losses, loss of human life, human suffering, and damage to and loss of personal and public properties. In addition major air and maritime calamities and traffic accidents have occurred frequently, while industrial and technical accidents have occurred occasionally.

Within the period of 1984-1989, about 18,591 major disasters were recorded with an annual average of 3,702 occurrences, resulting a total of 4,129 deaths and 9,260,449 suffering peoples, 153,788 houses collapsed and 441,493 damaged, with a total loss estimated at amount of Rp. 562,086,224,000.00 (eqv approx US\$ 315 million). These amount of estimated losses do not include the infrastructural buildings and constructions as well as environmental losses, which amounting almost twice or triple as much.

Within this context the Government of Indonesia is pursuing a policy of "disaster management" which emphasize on preparedness and mitigation programmes, this being those policies, procedures and response related to both in the pre- and post disaster phases which aim to reduce the negative impact of disasters on population living in prone and risky areas.

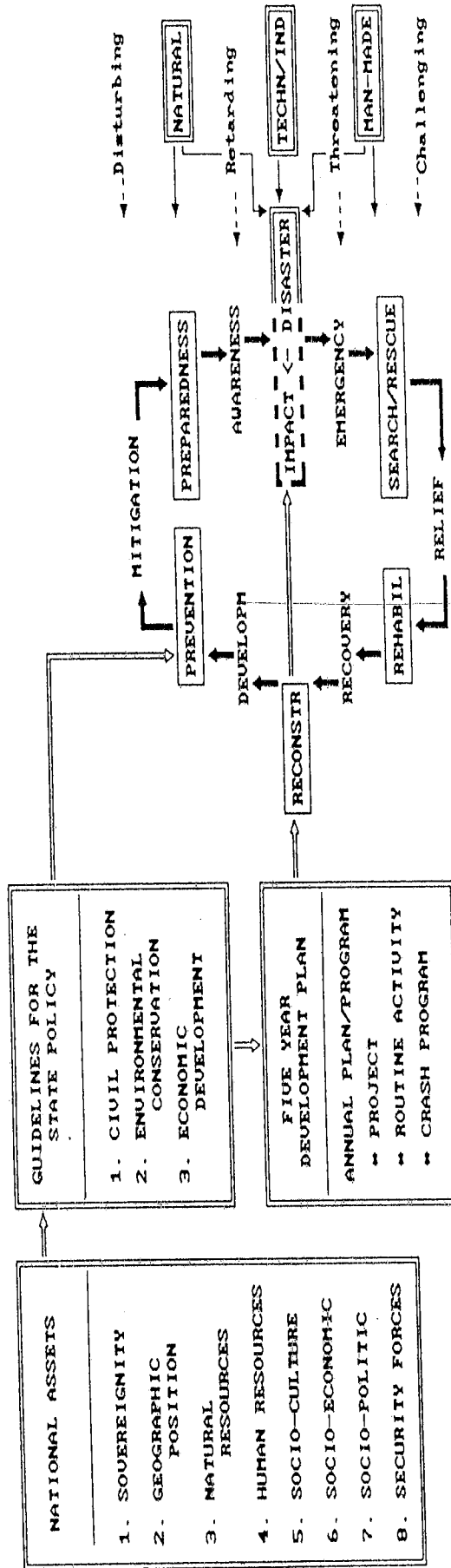
Disaster preparedness and mitigation as pre-disaster activities include those activities to collect data, analyse, and formulate counter measures as well as education and training programmes to enhance the awareness and preparedness of the peoples.

#### DISASTER MANAGEMENT

Intervention of the Government in disaster management often follows a cyclical pattern where a disaster occurs, and highlights the weakness in the response activities and the failure of protective measures. Greater efforts in

# INDONESIA NATIONAL DEVELOPMENT POLICY

## DISASTER MANAGEMENT PATTERN





rehabilitation, reconstruction, improvement of preparedness and better mitigation planning are achieved anticipating the next unpredictable disaster event.

Due to the complexity of disaster impacts the anticipation are been achieved multi-functionally and multi-disciplinary.

To facilitate the implementation of the Fifth Five-Year National Development Plan (REPELITA V), the Guidelines of the State Policy which were designated in 1988 by the National People's Assembly, describe inter alia three main objectives for disaster management, i.e. civil protection, environment conservation and national development safety and defense.

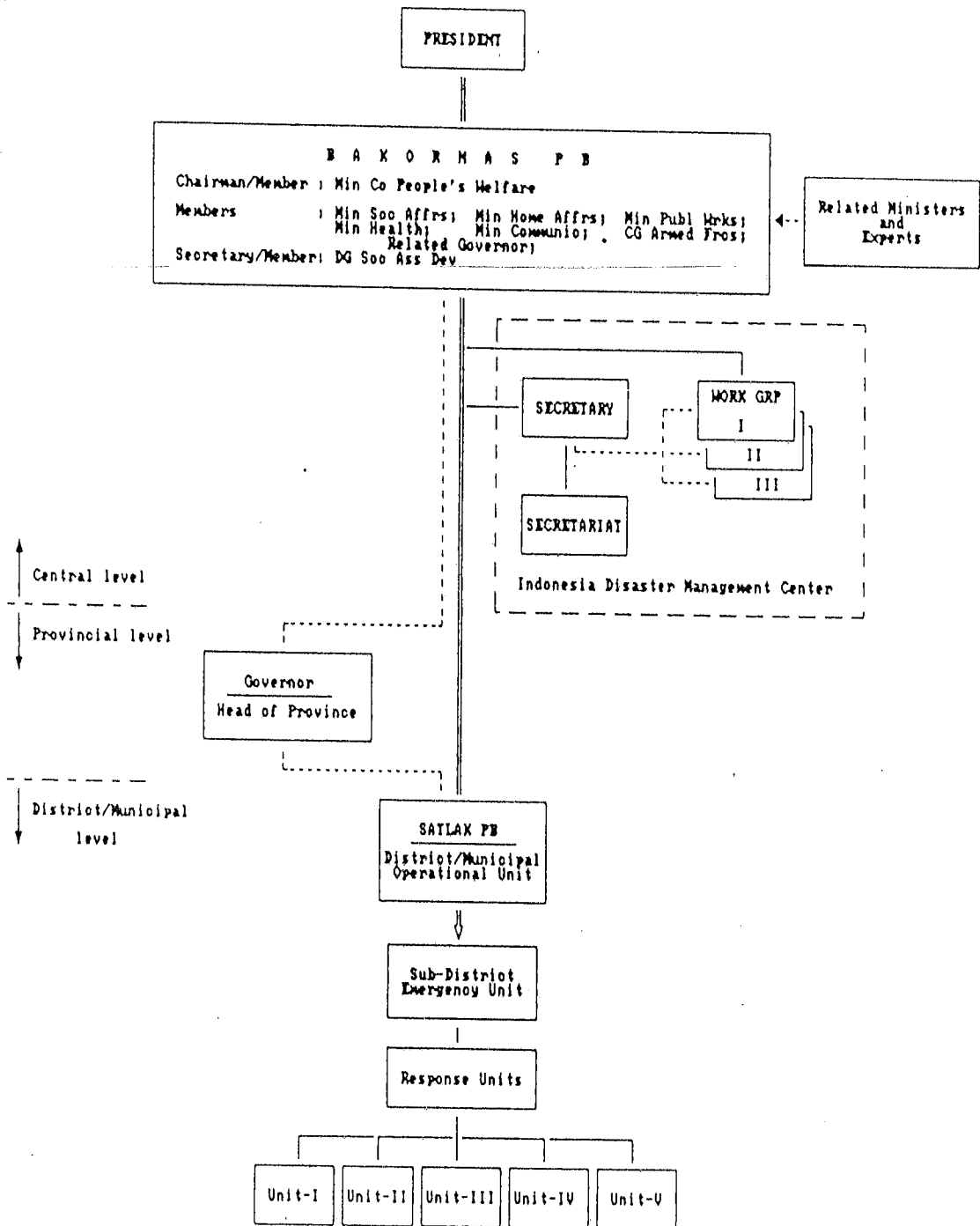
The disasters management strategy of the Government reflects those guidelines, that is to strengthen the community's awareness and preparedness to cope with possible disaster occurrences in prone areas, and to achieve environmental management, including all socio-economic and cultural components, integral to every aspect of development decision making.

In this context the foremost implication is that "sustainable development" or "environmental sound development" being directly related to every disaster management efforts. All experiences dealing with disaster management obtained since the establishment of the National Co-ordinating Board for Natural Disaster Management (BAKORNAS PBA) are being maintained and developed, and improvement has been made.

The strategy aims in the long term at having risk assessment, evaluation techniques practised by provincial level planners and authorities in all twenty seven provinces, and in having one up to date national disasters plan for each province. Training courses for disaster managers, government officials and non-government volunteer agencies, which have been conducted will be maintained continuously.

The need for continuous monitoring and control of all

INDONESIA NATIONAL CO-ORDINATING BOARD FOR DISASTER MANAGEMENT  
( BAKORMAS P B )



aspects at risk, caused by natural conditional changes or human interventions, is considered to be a pre-requisite for both planned operational response and targetted mitigation activities. Risk monitoring system is being developed into a centralised information and data processing system incorporating all disaster prone provinces and regencies.

Due to the wide spread prone areas the main disaster response activities are focused on the regency/municipality level to give the District Head or Municipality Mayor the full authority to take steps on disaster preparedness, mitigation and response in time of emergency, while the realated Governor as the Head of the Province has the responsibility to co-ordinate all departmental offices and non-governmental organizations at the province level to provide general assistance to the District/Municipal Operational Units (SATLAK PB) which are headed by the District Head / Municipality Mayor. The Governor at the central level as a member of the BAKORNAS PB take the guiding responsibility for the further steps to be taken and the preparation for the necessary general assistance to the SATLAK PB, i.e. disaster medicine, social and technical assistance, and other appropriate needs.

#### REGIONAL AND INTERNATIONAL CO-OPERATION

We have learned that development efforts need to be enhanced through co-operative activities with other countries and that disaster occurrences are not limited by administrative boundaries of a country. Therefore regional as well as international co-operation in disaster management would be vitally important to provide mutual assistance between interesting countries to help each others in strengthening the national capability to cope with disasters.

In this context our adoption of sustainable development concept has brought consequences to develop

preventive measures for disaster prevention and mitigation with reliable regional communication and information systems network to link up with all other country's disaster management centers in the region. Through this network warning systems on threatening disasters and emergencies could be conducted and continuously co-operation be maintained.

Responding the designation of the International Decade for Natural Disasters Reduction (IDNDR) campaign the Government of Indonesia has decided to constitute the National Co-ordinating Board for Disaster Management (BAKORNAS PB) as the National Committee to achieve national work programmes anticipating the UN-General Assembly resolution on IDNDR.

Sectoral and bilateral projects with technical assistance from other country which are direct or indirectly related to disaster management objectives have been co-ordinated and integrated to support the establishment of one comprehensive national disaster management system.

On-going projects conducted by several departments or institutions are :

1. Dept of Public Works with Japan (JICA) on Volcanic Debris and Flood Control which will be developed with River Disaster Engineering Project.
2. Dept of Mines and Energy with USGS, JICA and France on Geologic Hazards Engineering.
3. Dept of Communication (the Agency for Meteorologic and Geophysics) with France, WMO, and UNESCO on the Set up of Monitoring and Observation Network on Meteorologic and Seismic Activities.
4. Dept of Health with WMO on Disasters Medicine.
5. The Indonesia Institute for Sciences with Australia and UNESCO on Ocean Dynamics.
6. BAKORNAS PB / IDMC with ASEAN Countries, Australia, New Zealand, United Kingdom, Japan, USA, UNDP, UNDRO, UNESCO, UNICEF, ILO, ADPC/AIT, and other

countries/institutions on Disasters Preparedness and Disaster management projects.

7. Dept of Home Affairs with Japan on Fire Prevention and Fire Fighting project.

8. Dept of Forestry and Min of Population and Environment with USFS, CANADA, and UNEP on Forest Prevention and Environment conservation.

9. and others.

The implemetation of those projects have brought new concepts and methodology in disaster management which have improved the national capability and preparedness to cope with disaster and emergency occurrences. Indonesia would appreciate any technical assistances offered by all more established and experienced countries, and sollicite ESCAP to initiate co-ordinating effort for this co-operative projects within the Asian and Pasific region.

#### CONCLUSION AND RECOMMENDATION

Regional co-operative activities in Disaster Management could be improved and intensified in achieving all objectives agreed upon each member state capacity. Therefore national programmes would be achieved to strengthen the national capability and ability to enhance mutual assitancy in disaster management within the IDNDR spirit.

Indonesia is developing its national disaster management programmes in co-operation with almost international related countries and institutions to strengthen its disaster preparedness and disaster management capability with respects to meet the need in achieving the national development plan.

Indonesia appeal to ESCAP to initiate sponsorship for co-operative projects within the Asian and Psific region to improve national capability of each country to achieve training and research and study projects co-operatively.

Note of Reference :

This paper is prepared based on the data and informations

provided by the BAKORNAS PB Secretariat/IDMC.

---

asd/0191

POPULATION DENSITY PER KM<sup>2</sup>

5

	AREA KM <sup>2</sup>	1980	1985
JAYA & MADURA	132,187	690	775
SUMATERA	473,606	59	69
KALIMANTAN	539,460	12	14
SULAWESI	189,216	55	61
MALUKU	74,505	19	22
IRIAN JAYA	421,981	3	3
NUSA TENGGARA	88,488	96	106
INDONESIA	1,919,443	77	85

POPULATION GROWTH RATE

	1971-1980	1980-1985
INDONESIA	2,32	2,15

	1980	1985	2000
NUMBER OF POP	147,490	164,047	215,872

DISASTER OCCURRENCES BY TYPE  
APRIL 1986 - MARCH 1987.

NR	DISAST. TYPE	FREQ	SUFF	DEAD	HOUSES COLL	DAM	ESTIM' LOSSES RP
1.	VOLC. ERUPT	4	8,609	-	-	-	308,144,700.-
2.	EARTHQ'	2	1,351	-	29	269	385,000,000.-
3.	LAHAR FLOOD	-	-	-	-	-	-
4.	STORMS	911	107,580	75	4,105	8,485	19,431,052,000.-
5.	FLOODS	1,179	1,206,875	99	9,897	40,034	33,426,932,750.-
6.	LANSLIDES	621	40,407	98	965	2,128	12,940,638,450.-
7.	AGRI - PEST & DISEASES	27	85,434	-	147	-	50,640,000.-
8.	FOOD SHORT.	108	114,451	252	-	-	89,500,000.-
9.	TSUNAMIES	4	574	-	15	30	26,230,000.-
10.	STRIFE	26	3	-	-	-	-
11.	FIRES	1,454	587,266	78	8,869	7,466	36,707,019,900.-
12.	SHIP. ACCID	58	643	189	12	3	1,584,820,000.-
13.	POLLUTION	-	-	-	-	-	-
14.	OTHERS	286	9,170	201	19	53	183,444,500.-
TOTAL		4,680	2,162,583	992	24,058	58,364	105,134,482,300.-

DEP. SOS



DISASTER RECORDS IN INDONESIA  
1984/1985 - 1988/1989  
( PELITA - IV )

NO	FISCAL YEAR	FREQUENCY	SUFFERING	DEATH	HOUSES		ESTIMATED LOSSES ( PR. 10 <sup>3</sup> )	REMARKS
					COLLAPSED	DAMAGE		
1.	1984/1985	4,311	1,998,897	1,026	42,974	203,599	131,935,606.4	* NOT INCLUDED ENVIRONMENTAL AND INFRASTRUCTURE LOSSES
2.	1985/1986	4,576	1,999,352	942	59,190	119,506	80,725,868.8	
3.	1986/1987	4,680	2,162,583	992	24,058	58,364	105,134,482.3	
4.	1987/1988	2,423	1,105,752	725	12,293	25,059	130,517,312.	
5.	1988/1989	2,601	1,993,865	444	15,273	34,965	113,772,954.5	
TOTAL :		18,591	9,260,449	4,129	153,788	441,493	562,086,224.-	EGV. US\$ 335 MILLION
ANNUAL AVERAGE :		3,702	1,852,090	826	30,757	88,298	112,417,244.8	
PELITA - III ANNUAL AVERAGE		4,881	5,271,674	794	31,817	70,269	97,996,271.3	PELITA - III 1974/75-1984/85