National Report

of the People's Republic of China

on Natural Disaster Reduction

December 1993

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—— Prepared for the IDNDR Mid-Term Review and the 1994 World Conference on Natural Disaster Reduction

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FOREWORD

In the course of their own unrestrained reproduction and/or their stepped-up economic growth, human beings have in varying degrees ignored the importance of living in harmony with Nature. And now the vicious circle of the four major problems have been keenly felt, namely, the problems of population explosion, shortages of natural resources, environmental deterioration and aggravated natural disasters. These problems have posed an increasingly great menace to the very survival and growth of human beings themselves. In order to arrest and mitigate such malignant trends, the U.N. resolution launching the International Decade for Natural Disaster Reduction (IDNDR) was adopted and being implemented and the U.N. Conference of Environment and Development of 1992 (UNCED) was convened -- both representing an urgent call by Governments of all countries to this end, aiming at enhancing human awareness and calling for concerted actions by mankind as a whole.

Over the past decades, the losses and adverse social effects caused by natural disasters have been continually aggravating, especially in the developing countries. East Asia, South Asia and Western Pacific Sub-Region where developing countries are concentrated, are areas where most types of natural disasters and gravest disaster-afflicted losses have been recorded. As a populous developing country of this region, China has long suffered from various natural disasters. Therefore, since her founding in 1949, the People's Republic of China has progressively carried out activities to mitigate major natural disasters, such as flood, waterlogging, drought, typhoon, storm surge, blizzard, earthquake, landslide, mud-rock flows, sand-storm, soil-erosion, disease and insect pests in agriculture and forestry and forest fires, and has established relevant systems of management accordingly. In order to further improve the integrated disaster reduction awareness and the relevant capability of the whole society, China has since the early 1980s made full preparations, taken an active part in the concerted international action in disaster reduction, and formally set up China National Committee for the IDNDR in April 1989. The National Committee, in close collaboration with relevant departments and research institutions at the national, provincial and municipal levels, have made joint efforts to promote the disaster reduction undertakings. Through 5 years' efforts, there has emerged a social trend of enhanced disaster-reduction awareness and intensified actions at mitigating disasters. On the whole, however, these actions are somewhat dispersed, lacking the guidance of a national integrated planning, and the

comprehensive potentials of the existing disaster reduction capabilities have not been brought into full play. Constrained by her as yet weak economic base, China's standards of disaster preparedness and of disaster reduction are not high enough and remain to be enhanced.

Globally, human capability of predicting, forecasting, preventing and combating natural disasters is still rather weak. Therefore, to grapple with the common enemy--natural disasters--all countries should support one another and take concerted actions. Only in this way can world order and development be ensured. In this context, bearing in mind the safety and future of mankind, and in a spirit of promoting mutual assistance among countries to the best ability of each country according her level of development, the Chinese Government has exerted meticulous efforts to prepare this National Report in light of the specific conditions of China's natural disasters, characterized by their frequency, gravity and long history, and in accordance with the IDNDR requirements of National Report. As a contribution and a formal document by China to the IDNDR Mid-Term Review and to the 1994 World Conference on Natural Disaster Reduction, this National Report presents a comprehensive and systematic account of China's natural disasters and disaster reduction efforts, and of the nations's main experience, problems, difficulties and future work programm as well as an account of China's relevant responsibility and obligations in this regard. Meanwhile, China has noted the urgency and possibility of raising the disaster reduction efficacy in East and South Asia, and of the region's role in achieving the goals of the IDNDR. Moreover, China is conscious of her historical obligations in collaborating with friendly neighbouring countries for improvement of the disaster reduction undertakings.

The preparation of this National Report, having received generous support from all relevant government departments, specialists and scholars, has made use of the latest data available and has benefited a great deal by the view and suggestions of the relevant NGOs and people of various circles.

This Report has been approved by the Government of the People's Republic of China.

It is hoped that the Report will contribute to the success of the 1994 World Conference on Natural Disaster Reduction.

Chapter One History and Present Status of Natural Disaster Reduction Activities in China

Section 1 Brief History of Natural Disaster Reduction in China

China, a country with a vast territory and a huge population, has been plagued by nearly all kinds of natural disasters except volcanic eruptions. In a certain sense, therefore, the history of the Chinese Nation is a history of combating natural disasters. And in the course of history, China has created great water conservancy engineering projects of very long standing, such as the Dujiangyan Water Diversion and Irrigation Project of Sichuan Province and the Sea Dike of Zhejiang Province, and has accumulated rich experience in disaster reduction.

Since the founding of the People's Republic of China in 1949, while going all out for economic construction, the Communist Party of China and the Chinese Government have led the Chinese people to exert their efforts in mitigating natural disasters, and have allocated huge financial and manpower resources for this purpose.

In the early period following the founding of the People's Republic, with the Ministry of Water Conservancy and Ministry of Interior as the core, the Chinese government set up the Central Commission on Natural Disaster Relief to take direct charge of the management of natural disasters. And, in the light of the prevailing conditions of frequent floods and droughts, the Commission formulated the disaster relief policy of "Self-help through production, practising economy to tide over starvation, expanding mutual help, providing work as a form of relief and supplemented by the necessary relief funds"; and gigantic projects were implemented to harness the historically flood-causing big rivers, such as the Yangtze River (Changjiang River), Yellow River (Huanghe River), Huaihe River and Haihe River.

After tiding over the economic recovery period (1950-52) during which successive severe natural disasters had occurred, the Chinese Government initiated natural disaster reduction activities across the country, including massive afforestation drive and large scale efforts to

prevent and control crop and forest diseases and insect pests. In the mean time, the Government set up the Central Meteorological Administration (currently called China Meteorological Administration), State Oceanic Administration and State Seismological Bureau, to meet the demands of disaster management in China. In the 1970s, the Chinese Government further set up relevant departments and professional and research institutions to deal with the mitigation of natural disasters in the fields of flood, drought, meteorological, oceanological, seismic, geological disasters, as well as agricultural and forest disasters. The capability of preventing and mitigation natural disasters was thereby further improved.

Since the advent of the 1980s, China has persisted in her guiding principles of reforms and opening up. With the progress in socio-economic development, the nation's awareness of the damaging harm of natural hazards has been raise extensively. And the existing different types of disaster reduction systems have been gradually modernized. Satellite technology, remote sensing technology, modern communication, computer system, artificial intelligence and various up-to-date monitoring and forecasting equipment have been increasingly used in disasters monitoring, forecast, prevention and rescue, thus providing China with an initial capability to apply modern science and technology to mitigate natural disasters.

Since 1989, China's disaster reduction has entered a new stage. The Central Government and a number of local governments have established comprehensive disaster reduction organizations to conduct researches into policy measures on disaster reduction, to expand disaster reduction management and planning, to enhance cooperation with international community, and to further strengthen publicity and education in disaster prevention and mitigation. Meanwhile a large number of disaster reduction projects have been screened, formulated and implemented and activities relating to natural disaster reduction are being progressively incorporated into the nation's overall programme of socio-economic development.

Section 2 China National Committee for the IDNDR

1. Establishment, Composition and Function

China National Committee for the IDNDR (hereinafter referred to as CNCIDNDR) was set up in April, 1989 by the Chinese Government in response to the UN Resolution 42/169. The

Committee is an inter-ministerial coordination organization, chaired successively by Vice-Premier Tain Jiyun, State Councillors Luo Gan and Li Guixian. CNCIDNDR committee members are leading cadres from 27 Ministries, Commissions and Administrations under the State Council as well as from the Headquarters of the General Staff of the People's Liberation Army. The component units of the Committee are the following:

Ministry of Foreign Affairs,
State Planning Commission,
State Economy and Trade Commission,
State Education Commission,
State Science and Technology Commission,
Ministry of Public Security,
Ministry of Civil Affairs,
Ministry of Finance,
Ministry of Geological and Mineral Resources,
Ministry of Construction,
Ministry of Railways,
Ministry of Communications,
Ministry of Posts and Telecommunications,
Ministry of Water Conservancy,
Ministry of Agriculture,
Ministry of Forestry,
Ministry of Interior Trade,
Ministry of Foreign Economic Relations and Trade,
Ministry of Broadcasting, Film and Television,
Ministry of Public Health,
Chinese Academy of Sciences,
China Meteorological Administration,
State Oceanic Administration,
State Seismological Bureau,
The China Red Cross Society,
The National Natural Sciences Foundation of China,
The People's Insurance Corporation of China,
The Headquarters of the General Staff of People's Liberation Army.

Office of the National Committee along with the Experts Committee under the CNCIDNDR

has been designated to take charge of the organizational work relating to disaster reduction national activities, scientific research, technical training, information exchange and risk assessment, general public education and to assist in, and provide data for, Government decision-making with respect to disaster reduction.

2. Major Activities Undertaken

(1) Publicity

Beginning with the television speech by Vice-Premier Tain Jiyun, entitled "Go all out, to unfold activities of the Decade for Natural Disaster Reduction in China" delivered on February 12, 1990, CNCIDNDR has persisted in extensive publicity of IDNDR. This includes:

— Having conducted annually, around the IDNDR Day, extensive publicity activities, centring around the annual theme on disaster reduction, to carry out various kinds of mass-participating activities and, for this purpose, making a good use of relevant artistic forms and of the mass media, including broadcasting, TV programmes and press reports.

— Having founded and circulated over 10 kinds of newspapers and journals on disaster reduction, for disseminating knowledge of disaster mitigation and reduction and for promoting scientific research in this regard, with some of these journals having been sent abroad for exchanges with other countries.

— Having organized various kinds of disaster relief and disaster reduction activities with the participation of people from various circles, mass organizations and relevant departments, with a view to further enhancing the people's disaster reduction awareness.

(2) Organizing Disaster Reduction Undertakings

Having drafted the "Framework for IDNDR in China", CNCIDNDR has, on the basis of the adopted Framework, been engaged in the following undertakings:

— Coordinating and organizing the study, discussion and identification of the national and local disaster reduction strategy and measures and related major problems, with the

participation of the relevant Ministries and Commissions and part of the Provincial(or Municipal) Governments.

— Organizing and coordinating scientific research institutions, universities and colleges, academic societies in holding disaster-related seminars and workshops and putting forward recommendations on natural disaster reduction.

— Giving guidance to the establishment of IDNDR subcommittees in relevant Ministries and some provinces/municipalities, or designating the appropriate existing unit to take charge of disaster reduction matters concurrently at the corresponding level.

— Supporting, assisting and joining relevant regions and departments in their disaster reduction activities.

(3) Practice in Disaster Reduction

— Having taken an active part in China's 1991 Severe Flooding relief operations when eastern China suffered exceptionally severe floods, and in this connection having made urgent appeals to the international community for disaster-relief assistance to the stricken areas and organized domestic donations.

— Having sponsored in 1993, jointly with the art circle of Hong Kong, Charity Shows for Poverty Alleviation in disaster-stricken areas, lasting six months thereby helping raise funds exclusively for disaster reduction and related poverty alleviation.

(4) International Cooperation

— Having coordinated and organized relevant academic exchanges and negotiations on disaster reduction cooperative projects with relevant UN agencies, international organizations and friendly countries. Since 1990, 21 international seminars, workshops and conferences on disaster reduction have been held in China.

Section 3 China's Policy, Institutional Systems on Disaster Reduction and the Achievements Scored

1. China's Policy on Natural Disaster Reduction

Viewing disaster reduction as an important aspect of promoting social progress and economic development, China has incorporated disaster reduction into the overall national socio-economic development programme.

On disaster reduction, the guiding principle formulated by the Chinese government is "Give top priority to disaster prevention and integrate this with disaster-combating and relief operations".

China's major policy measures on disaster reduction are: Accelerating the establishment and strengthening of monitoring and forecast systems on natural hazards, improving the quality of monitoring and forecast, stepping up construction of disaster reduction engineering projects, and integrating these with economic development so as to raise the nation's overall capability of disaster prevention; After occurrence of disasters, mobilizing all the necessary forces and resources to minimize loss in life and property to guarantee the livelihood of disaster-stricken people and to mitigate the disaster effects; Further improving the related work, including improvement of relevant laws and regulations on disaster reduction, and strengthening publicity and education to raise the awareness of the whole nation; Giving full play to the role of science and technology in disaster reduction.

2. China's Institutional Systems for Natural Disaster Reduction

In natural disaster reduction, China integrates the unified policy decisions by the central government with co-ordinated and concerted implementation by the relevant departments according to their respective fields of competence. The institutional systems are as follows:

(1) The national comprehensive coordination organization:
— China National Committee for the IDNDR, composed of 28 departments.

(2) The national comprehensive coordination organization for specific types of natural disasters:

— Headquarters for National Flood Prevention and Drought Control.

(3) Comprehensive coordination organizations at local levels:

— The Local Government or local IDNDR Committees.

(4) The local comprehensive coordination organization for specific types of natural disasters:

— The local Headquarters for Flood Prevention and Drought Control.

— The local Headquarters for Forest Fire Prevention.

(5) Scientific research institutions, universities and colleges, relevant NGOs.

3. China's Main Achievements in Natural Disaster Reduction

In the course of economic development, the Chinese Government has allocated the necessary financial resources to disaster reduction. According to preliminary statistics, China has since 1949 put 300 billion *yuan* through various channels into disaster reduction, whereby the economic benefits gained amount to double that of the financial input, and the social benefits have also been remarkable.

— Regarding the construction of disaster reduction engineering projects. Over 40 years, China has cumulatively built over 100 billion *yuan*'s worth of fixed assets in facilities relating to flood prevention, drought combating and water conservancy. Moreover, the nation has completed reinforcement projects against earthquake in 14 main railways, 90 key power plants, 6 major petroleum pipelines, 20 large oil refineries, some super-large ethylene projects, key iron and steel plants, and large-scale reservoirs. Furthermore, China has intensified efforts at afforestation and construction of shelter forests, so that the forest coverage has been raised from 8.6% in the 1960s to the current 13.92% level. In addition, in the last ten years, 1.5 hundred million *ha* of land areas affected by pests and other ecological disasters have been brought under control annually, and in recent years, disaster prevention bases have been built up in the nation's pastoral areas or grazing land.

— Regarding establishment of monitoring and early warning systems. So far, China has set up a meteorological monitoring and forecast network consisting of more than 2600 weather stations, a hydrological monitoring system encompassing 8000 precipitation and water level

monitoring stations, a pre-seismic observatory network comprising over 1000 stations, a monitoring and forecast system consisting of 3000 plant disease and insect pests monitoring stations, a predicting and early-warning system on grassland insect pests and rodent, encompassing 240 stations, a monitoring and early-warning network on marine and coastal disasters consisting of 280 ocean-watch and tidal stations, in addition to the forest and grassland fire monitoring systems and geological disaster surveying and warning systems, etc. And telephones, radio communication networks, television and local radio networks have been extensively used in the timely transmission of disaster-related information.

— Regarding organization of disaster relief operations. In an average year (i.e. in the absence of severe natural disasters), the Central Government annually allocates 1.4 billion *yuan* and more than 1.5 million tons of grains as well as a considerable amount of materials and daily necessities for disaster relief operation; and these are duly distributed, thereby satisfying the basic needs of disaster stricken people. In addition, natural disaster insurance has also been expanded.

— Regarding rescue operations. With the establishment of national networks for epidemic disease prevention and medical rescue, emergency medical treatment has been given to a great number of the sick and the injured. As a result, epidemic diseases have been controlled or eliminated in the seriously hit disaster areas, particularly in the aftermath of disastrous floods.

— Regarding relevant science and technology. China has strengthened disaster reduction through the application of relevant science and technology. To date, over 100 specialized institutions have been set up and are engaged in disaster reduction research across the country. And the State has allocated an additional input of one hundred million *yuan* for the scientific and technological research on disaster reduction in the 8th Five-Year Plan period (1991-95).

— Regarding publicity. Extensive publicity and education in disaster reduction has been conducted, and legislation relating to disaster reduction has also been strengthened.

Chapter Two China's Major Natural Hazards and Risk Assessment

China is one of the few countries where natural hazards strike frequently and cause heavy damage. Flood, drought, typhoon, storm-surge, earthquake, landslide, mud-rock flow, pests and other ecological disasters, forest-fire, etc. frequently affect large areas of the country, bringing enormous damage to human life and property.

Section 1 Summary Account of Natural Hazards in China

1. The Features of Natural Hazards in China

The main features of natural hazards in China are as follows:

— Large Variety. A country vast in territory and complex in climatic and geographical conditions, China suffers mainly from such kinds of natural hazards as drought, flood, typhoon, earthquake, hails, freezing spells, snow storm, forest fire, plant diseases and insect pests, landslide, cave breakdown, mud-rock flow, sandstorm, storm surge, sea wave, sea ice and red tide, etc. Among these hazards, drought, flood, typhoon and earthquake are most destructive.

— High Frequency. Since 1949 when the People's Republic of China was founded, on an average drought has occurred 7.5 times each year, flood 5.8 times, typhoon (including tropical storm) 6.9 times, freezing spells 2.5 times--all being relatively high in frequency. Over the past 44 years, China has suffered more than 50 earthquakes of force 7 or greater magnitude on Richter's Scale, including three force 8 earthquakes. Major storm surges strike China's coastal areas 7 times a year on average. Cases of landslide, cave breakdown and mud-rock flow occur more than 100 times annually. Major plant diseases and pests strike once every three or four years. Each year 8 million *ha* of forest suffer insect pests or disease infections. And 20 million *ha* of grassland are affected by insect pests and rodents. Thus, China is one of those countries in the world where natural disasters strike rather frequently.

— Regional and Seasonal Features. Drought tends to occur mainly the Northwest Loess Plateau and North China Plain in spring and autumn. Flood and waterlogging mainly occur in the seven big river valleys in summer. Typhoon and storm-surges strike mainly the southeastern coastal regions, and earthquakes occur mainly in southwestern, northwestern and northern China. Forest and grassland fires mainly in the forest and pastoral areas of northeastern, southwestern, northwestern and northern China in the dry season of winter and spring.

— Serious damage. Natural disasters have brought heavy economic losses, human injuries and deaths to the nation's stricken areas.

2. Serious Damage Done by Natural Hazards

Natural disasters cause heavy losses to life and property in China and have become important factors hampering the sustainable development of China's economy. In an average year since 1949, natural disasters would result in wracking 40 million *ha* of farm crops, causing a loss of 20 million tons of grain, destroying 3 million houses, affecting 200 million people--with 3 million people in need of resettlement and a death toll of thousands of people--and bringing a direct economic loss of several billion *yuan*. Damage would be even heavier in major disaster years or when catastrophic hazards occurred.

In the last 4 years, the direct economic losses caused by natural hazards were:

1989 52.5 billion *yuan*
1990 61.6 billion *yuan*
1991 121.6 billion *yuan*
1992 85.4 billion *yuan*

On an average, China's losses caused by natural disasters accounted for nearly a quarter of the global total (of about US$ 50 billion annually) in the early 1990's.

Section 2 Major Natural Hazards in China

1. Atmospherical and Hydrospherical Disasters

— Flood and Waterlogging. These are China's biggest natural hazards in terms of occurrence frequency and the losses caused. From 1951 to 1990, China annually experienced an average 5.9 times of floods and waterlogging, with maximal 10 times and minimal 3 times in one year. In terms of occurrence frequency, rainstorms and floods are very high in the southeastern coastal areas, the Yangtze River and Huaihe River valleys, the Dongting Lake area and Poyang Lake area --in these areas, rainstorms and flooding occurred 15-32 times over the past 40 years. Since 1949, on an average the flood-affected areas totalled 7.95 million *ha* annually, of which 4.41 million *ha* suffered severe damage. From 1989 to 1992, the annual average flood-affected areas totalled 14.76 million *ha*, of which 7.33 million *ha* was severely flooded and 1.67 million *ha* was rendered yieldless; and these floods caused a death toll of 3000-4000 people and the destruction of over 2 million housing units. In 1991, 18 provinces/autonomous regions/municipalities in China were hit by natural disasters in varying degrees, with the lower Yangtze River valley & Huaihe River valley and the Taihu Lake area suffering from severe floods and waterlogging rarely recorded in history. And these disasters damaged 24.6 million *ha* of crops, claimed the deaths of 5113 and destroyed 4.98 million housing units, causing a total direct economic loss of 77.9 billion *yuan*.

— Drought. From 1951 to 1990, on an average, China experienced 7.5 times of drought annually, with maximal 10-11 times and minimal 3 times in an individual year. In the agricultural areas of eastern China encompassing the Yellow River and Huaihe River, Haihe River valleys, higher frequency of drought was recorded, where 30-40 times of droughts occurred in 40 years. Since 1949 on an average, 20.7 million *ha* of land was hit by drought annually, of which 7.89 million *ha* was severely affected. From 1989 to 1992, 26.37 million *ha* was affected by drought on an average each year, of which, 12.67 million *ha* was severely affected.

— Typhoon and Storm Surge. From 1949 to 1992, 7 typhoons (including tropical storms) landed in China in an average year, with a maximum of 12 and a minimum of 3 within a year. Typhoons landed mainly on the coastal areas of southeastern China, where 89% of the total were recorded, and the coastal areas of Guangdong, Hainan, Fujian, and Zhejiang Provinces were the worst affected. From 1989 to 1992, a total of 33 typhoons landed in

China, causing on average an annual typhoon stricken area of 3.07 million *ha*, damaging 189000 housing units, killing about 450 people, thus causing an annual direct economic loss of over 8 billion *yuan* on an average.

Storm surge is the most destructive marine/coastal hazard for China. One storm surge (one in Shanghai in 1696, and the other one in Guangzhou in 1862) claimed over 1 hundred thousand deaths. Many typhoons that had brought severe damage are caused by storm surge. In 1992, a catastrophic storm surge caused 200 deaths and an economic loss of 9.6 billion *yuan* in the affected coastal areas. Between 1949 and 1992, China experienced 13 times of catastrophic storm surge; in addition, 84 times of storm surge also caused severe economic losses and casualty.

— Other Disasters. Windstorms, hails, snowstorms, freezing spells, sea wave and sea ice, coastal erosion, etc. are also serious natural hazards for China.

2. Seismic and Geological Disasters

— Earthquakes. From 1949 to 1992, earthquakes had killed 277000, injured and disabled 836000 people in China, damaged over 11.393 million housing units, and caused a direct economic loss of tens of billion *yuan*. According to statistics, deaths from earthquakes totalled 610000 people in China since the beginning of this century, accounting for 50% of the global deaths from earthquakes.

On July 28, 1976, an earthquake with a magnitude of 7.8 on the Richter's Scale hit Tangshan municipality of Hebei Province, killing 242000 people and badly injuring and disabling 164000 causing a direct economic loss of over 10 billion *yuan*. That severe earthquake destroyed the whole of Tangshan, a key city in northern China and, moreover, damaged 1/3 of the buildings in Tianjin. Besides, major earthquakes that occurred in China from 1966 to 1992, included the following: the 1966 Xingtai earthquake, measuring 7.2 on the Richter's Scale; the 1970 Tanghai earthquake in Yunnan Province, with a Magnitude of 7.5; the 1975 Haicheng earthquake in Liaoning Province, with a Magnitude of 7.3; the 1988 Langcang-Gengma earthquake in Yunnan Province measuring 7.6 on the Richter's Scale.

The characteristics of seismic disaster in China are that the western part of China is liable to be struck by stronger quakes than those striking the eastern part (in terms of magnitude),

however the economic losses and casualties brought by earthquakes to the eastern part are much heavier than those to the western part of China.

— Geological and Geomorphological Disasters. There are 410000 places in China suffering from geological disasters such as cave breakdown, landslide, mud-rock flows, and a total area of 1500 square kilometres is affected by subsidence of various kinds. Since the 1980s on the average, the decertified land annually expands by 2100 square kilometres, and the area of soil erosion exceeds 1.8 million square kilometres, affecting 24 provinces. In the past decade such disasters as cave breakdown, landslide and mud-rock flows on average took a death toll of 900 people each year, and caused a direct economic loss of 3.6 billion *yuan*.

3. Biological Disasters

— The crops biological disasters in China can be classified into 1400 kinds, among these, 770 are caused by pests, 550 by plant diseases, 60 by weeds and 20 by rodent. From 1989 to 1992, these various biological disasters damaged 47 million tons of grain and 1.26 million tons of cotton.

— Grassland rodent and insect pests affect more than 20 million *ha*, causing degradation of grassland and adversely affecting the quantity and quality of the forage grass.

— Forest diseases and insect pests in China are of 8000 kinds, of which 200 kinds cause severe damage frequently. Since the 1980s, these diseases and pests annually affected some 8 million *ha* of forest areas (11 million *ha* in 1989), causing a direct economic loss of 2 billion *yuan*, greatly surpassing the losses caused by forest fires.

— About 200 kinds of epidemic diseases affect the breading of aquatic products like fish, shrimps, lobsters, algae, crabs and artificially-bred frogs. From 1990 to 1992, these diseases caused an annual economic loss of around one billion *yuan*.

4. Forest and Grassland Fires

— China is one of the countries whose forest fires are most frequent and are causing heavy losses. Since 1950, an annual average of 16000 forest fires has occurred in China, affecting 985000 *ha* of forest areas, causing an annual direct economic loss of over 1 billion *yuan*, and

a death toll of 105 people. The 1987 extraordinary Daxinganling Forest fires were most damaging, having affected an area of 1.33 million *ha* and having damaged 870000 *ha* of forests, caused the deaths of 213 persons, and burned into ashes 80.25 million cubic metres of stocked timber, thus causing a total direct economic loss of over 2 billion *yuan*.

— In China, fires pose a threat to 2 hundred million *ha* of grasslands, of which, nearly one hundred million *ha* are frequently afflicted. Since 1949, 50 thousand fires of varying magnitude have stricken the pastoral areas and grazingland, killing 430 people and causing a total economic loss of over 30 billion *yuan*.

Section 3 Risk Assessment of Natural Hazards in China

The risk level in China is related not only to the hazard-formative factors, but also to the land use structure, regional economic levels and the disaster combating capability in various regions.

1. The Structure of Land Use and Natural Hazard Risks

— China is a populous country with meagre land resources, with her usable land largely taken up by agriculture and forestry, and her levels of industrialization and urbanization being as yet relatively low. According to statistics, of the 9.6 million square kilometres of China's total land area, n-land accounts for 13.1%, vegetable-garden 0.8%, forests 21.6%, pastures in current use 27.5%, water areas 3.8%, human settlement and industrial-utilized land 2.2%, land utilized for communication facilities 0.8%, the unused land (with difficult terrain features) 30.2%. The nation's per capita land is 0.97 *ha*, per capita farmland is 0.09 *ha*, and per capita construction land is only 0.002 *ha*.

— At the macro level, China's structure of land use has determined the disaster composition of China, namely, in terms of scope, the bulk of farmland and pastures are the main areas threatened by natural hazards. In the event of a disaster, therefore, peasants and herdsmen are affected the most, and in case of a destructive disaster, thousands upon thousands of households would be adversely affected. However, in terms of losses, those caused by disasters in urban areas would usually be much heavier. The nation's structure of land use therefore determines that China should not only strengthen key engineering projects against

natural hazards in the urban and industrial areas, but also should attach importance to the improvement of the disaster combating capability in the rural and pasture areas.

2. Regional Differentiation in Risk Levels

Fig.1 indicates the centre locations of various major natural hazards in China, such as flood and waterlogging, drought, typhoon, storm surge, earthquake, landslide, mud-rock flow, plant diseases and insect pests, forest fires. And from this one can see the overall distribution pattern of China's hazards affected areas.

As hazard-formative factors and regional economy share distinctive difference between the coastal areas and inland areas, as well as between the southern and northern areas, the risk levels of natural hazards also vary accordingly. A division line drawn from Heilongjiang Province down to Yunnan Province would serve as a demarcation line, to the east of which is China's eastern part; and to its west, the western part--with a transitional zone along both sides of this line:

— The eastern part is prone to various kinds of hazards with strong intensity and high frequency. In this part of the country urbanization and industrialization are growing rapidly and economy is relatively more developed. The GNP per capita in 1992 reach 2852 *yuan*. Therefore, this part is the high risk region, where the risk levels listed in a descending order are: northern China, the coastal areas, the lower Yangtze River valley and Huaihe River valley, and finally northeastern China. Take the year 1992 for example, the direct economic losses caused by all kinds of natural hazards in this part accounted for 48% of the nation's total in the same year.

— The middle part, or the transitional zone along both sides of the above-mentioned line, is situated between the eastern and western parts of China, where the types, intensity and frequency of natural hazards are all at the intermediate levels. In recent years, as a result of the enhanced construction of energy resource bases, the economy development in this part has been accelerated and the GNP per capita has reached 1609 *yuan*. This region has great potentials for further economy development, and it is a region with intermediate disaster risks. Here, the risk levels listed in descending order are: the farmland and pastures areas adjacent to northern China, southwestern China, the areas bordering the Provinces of Hunan, Guizhou, Guangxi and Sichuan. In this part of China, in the year 1992 the direct economic

losses caused by natural hazards accounted for 34% of the nation's total in the same year.

— The western part. This is a vast region characterized by higher altitude, frigid weather, arid land, high mountains and plateau and large stretches of deserts, with a rather fragile ecological environment, and wide-spread natural hazards. Constrained by the physical conditions and historical reasons, the overall economic level in this region is relatively low, except for the river valleys and the oasis areas where population is dense and economy has developed more rapidly. The GNP per capita of this region is 1391 *yuan*. Therefore this is a low-risk region. Within this region, the risk levels listed in descending order are: the river valley in the northwestern areas and the oasis areas to the southern of the mountains, the valley areas in southern Tibet Autonomous Region of China, Inner Mongolia and Northern Tibet Plateau of China. In the year 1992, in this vast region the losses caused by natural hazards accounted for 18% of the nation's total in the same year.

Chapter Three China's Undertakings in Natural Disaster Reduction

The Chinese Government has long regarded disaster reduction as one of the basic state policies for promoting social stability and sustainable economic development, and has attached importance to disaster reduction undertakings, thus scoring great achievements over the past dozens of years.

Section 1 China's Construction Works in Disaster Reduction Engineering

While following the basic policy of "Giving priority to prevention and integrating it with disaster combating and relief operations", China's disaster reduction engineering also embodies the economic principle of "promoting what is beneficial and simultaneously eliminating what is harmful", so as to contribute to the nation's sustainable and steady socio-economic development.

China's construction works in disaster reduction engineering mainly include: engineering works beneficial to large areas, such as flood prevention/control and drought combating engineering works, seismic prevention and quake-resistance engineering works, landslide and mud-rock flow control projects, shelter-forest ecological engineering projects, desertification control engineering projects, forest disease prevention and insect pest control projects, agricultural ecological-disaster control engineering projects, forest and grassland fire control engineering projects, as well as engineering projects to address hazards of lesser impacts.

These engineering projects are mainly located in the middle and lower reaches of major rivers, where the ecological environment is relatively fragile and the areas are prone to relatively serious natural hazards'(see Fig.2).

1. Flood (tide) prevention and drought combating engineering works

— Up to 1992, China had built a series of engineering projects in this connection, including 24.2 thousand kilometres of flood preventive/control dikes, and 84000 reservoirs of medium and large sizes with a total water holding capacity of 466.8 billion cubic meters; 12000 *kms*

of tidal barrage; 490 thousand irrigation and drainage stations and 2.95 million motor-pumped wells with a total irrigation and drainage power of 65.97 million kilowatts; 5531 irrigated regions, with each covering an area of (or over) 667 *ha*; thereby bringing the total area of effectively irrigated land to 49.46 million *ha*. In addition, soil erosion in a total area of 58.64 million *ha* was initially brought under control.

— Physical infrastructure to strengthen agriculture's drought-combating capability has been intensified, and the relevant engineering projects include: those aimed at raising water-utilization efficiency through networks of plastic pipes, underground pipelines and cement canals; those involving construction/improvement of terraced land, dike-protected land, sandy land and underground reservoirs; those aimed at drought-combating by means of eco-farming, through great efforts at building shelter forest-belts and extensive grass planting; and those involving adoption of drought-combating cropping practices, including adjusting cropping patterns, selecting and using drought-resistant strains, and expanding areas of plastic-film covered farming plots.

Over the past 40 years, the flood prevention control engineering undertakings have played a significant role in China's disaster reduction, having saved the nation an estimated 300 billion *yuan* of losses which would have otherwise occurred, and having also brought about remarkable social benefits. The large-scale flood prevention engineering projects that have already been in use include: the flood prevention system in the lower reaches of the Yellow River, the river-harnessing engineering projects of the Yangtze River, Huaihe River, Haihe River and Liaohe River, etc. The engineering works currently under construction include: the harnessing projects of the Huaihe River and Taihu Lake; the Xiaolangdi Water Dam Engineering Project on the Yellow River, in addition to the gigantic Three-Gorge engineering project on the mighty Yangtze River and the great engineering project to channel water resources from the south to northern China--both known as "National engineering projects spanning the 2 centuries".

2. Seismic Prevention and Quake-resistance Engineering

On the basis of reinforcing seismic designing for new buildings and new projects, and seismic strengthening of existing buildings and structures lacking in earthquake resistant capability, regional comprehensive quake-resistance undertakings have been implemented, including works aiming at quake-prevention, earthquake isolation and alleviation. Thus,

reinforcement works against earthquake covering 230 million square metres of buildings of various types and covering the sites of a number of key facilities have been completed. These include:

— Reinforcement engineering works of major public-utility facilities in quake-prone areas have been completed, covering the communication, signal, water and hydropower supply facilities and the locomotive engineering and management facilities of China's 14 trunk railway-lines, such as the railways of Beijing-Baotou, Beijing-Guangzhou, Tianjin-Pukou, and Longhai and thousands of railway bridges.

— Reinforcement works of 90 key power plants in the major grid of northern, northeastern, eastern, northwestern China and central parts of China.

— Reinforcement works of long-distance communication centres and part of class A communication lines and communication facilities.

— Reinforcement works of the engine-houses and pump-stations of the 6 major petroleum transmission pipelines, including the Shandong-Ningxia pipeline, Shenyang-Dalian pipeline and Qinhuangdao-Beijing pipeline.

— Reinforcement works of 60 major reservoirs, including the Miyun, Guangting, Yuecheng, Doushan Reservoirs.

— Reinforcement works for large-size (or key) enterprises located in areas which had been stricken by earthquakes above magnitude 7 on the Ritcher's Scale, including 20 large oil refineries, a large-size ethylene processing project with a productive capacity of nearly 1 million tons, more than 20 key iron and steel plants and other key enterprises which have great bearing on the national economy and people's livelihood.

3. Geological Disaster Prevention and Control Engineering Undertakings

— Geological survey has been carried out at the site of projects in mountainous areas prone to mud-rock flows in southwestern and northwestern China and Beijing, in areas prone to subsidence in the Wuhan Municipality of Hubei Province, and areas prone to landslide in Chongqing Municipality, as well as in areas prone to land-fissure in Xi'an Municipality.

— Large-scale works for prevention and control of landslide, cave-breakdown or mud-rock flow have been carried out in over 10 key areas and communication lines prone to such risks. Currently, such works are being carried out in 5 areas prone to land-slide, including the area of Liantzeya Precipice in the Three-Gorges Region of the Yangtze River.

— Comprehensive measures to harness sea-water erosion in the Laizhou gulf of Shandong Province have also been carried out.

4. Engineering Projects for Shelter-belt Systems, Afforestation and Combating Desertification

In the last 10 years, the nation has exerted great efforts in afforestation, and the results include that through the nation-wide drive of voluntary tree-planting, the accumulated number of trees so planted has reached 13 billion; that the urban greening areas have reached 473000 *ha*; that the nation annually increases her forest acreage by 5.33 million *ha*; that the total acreage of the nation's standing man-made forests has been increased to 33.79 million *ha*; and that the nation's forest coverage-rate has been raised from 8.6% in the early 1960s to the current 13.92%. In addition, the standing man-made grass-lands have been increased to 12 million *ha*.

— The "3 Northern" Shelter-belts Systems, covering vast areas of 13 Provinces and Autonomous Regions in northwestern, northern and northeastern China, have in a period of 14 years brought into being 13.4 million *ha* of man-made forests. As a result, in the vast areas of these Provinces and Autonomous Regions the forest coverage has been raised from 5.6% to 9.1%, 11 million *ha* of farm-land has been protected by the shelter-belts, and the sand-storm over a total area of 6.67 million *ha* has been brought under control.

— The shelter-belt system along the upper and middle reaches of the Yangtze River. Since its implementation in 1989, 3 million *ha* of man-made shelter-forests have been brought into being.

— The coastal shelter-belt system. Implemented since 1989, with an original tree-planting target of 3.56 million *ha*, the coastal shelter-belt system completed so far includes: 13000 *kms* of coastal shelter-belt, 2.47 million *ha* of farm-land protection shelter-belt network along the coast. Thus, the coastal man-made forest area now totals 6.67 million *ha*.

— The greening engineering projects on the plains. These involve 918 counties in the plains areas of the nation. Of these, 632 counties have reached the greening standards set by the State for the plains, with shelter-belt networks completed in 28.67 million *ha* of farmland in the plains, accounting for 82% of the areas suitable for afforestation..

— Taihang Mountains Greening Engineering Projects. Covering vast areas of the Taihang Mountains Range in 4 Provinces (and Municipalities), these projects have begun implementation, and are programmed to bring about 3.299 million *ha* of afforested areas by the year 2000.

— Sand Fixation and Desertification Control Engineering Projects. These are being implemented, and are designed to bring 7.119 million *ha* of desertification-prone land and decertified land under control by 2000.

— Engineering Projects of Grass-planting and Grassland Protection.

5. Forest-Fire Prevention and Control Engineering Projects

The national forest-fire prevention and control efforts have been markedly intensified since 1988. Annual forest fire occurrences have dropped from 16000 (in 1950-1978) to 9000 (1988-1992), the fire-damage rate has dropped from 8.5 per thousand to 0.4 per thousand.

— With assistance from World Bank, the Daxinganling Mountains Forest Post-Fire Rehabilitation Project has been completed. In the 4 years of its implementation, 3900 *kms* of passway and log-transportation roads have been built or widened, and a comprehensive system to prevent and control forest-fires has been established to cover 22 million *ha* of forests.

6. Prevention and Control Engineering Projects against Biological Disasters in Agriculture and Forestry

— According to statistics in 1991, more than 28000 plant-protection companies, "plant hospitals" and professional task forces at township and county levels have been set up across China, employing more than 20000 professionals. And preventive or control measures against plant-diseases, insect-pests, rodents, etc. have been carried out by professionals in over 10%

of the nation's afflicted areas.

— According to statistics in 1979-1988, annually on an average, preventive or control measures had been taken against the above-mentioned biological disasters in 150 million *ha* of China's farmland, accounting for 80% of the farmland prone to such disasters.

— Initial surveys have identified more than 1000 kinds of biological control-agents resources against agricultural pests. In 1991, biological control was applied to 20 million *ha* of farmland nationwide.

— By the end of the 1980s, integrated pest management (IPM) technology in rice production was disseminated and applied to 13 million *ha* of paddy fields annually, accounting for 10 percent of the areas under the past-control programme. In recent years, emphasis has been laid on the control of cotton boll-worm in cotton fields, on the monitoring and control of brown plant-hoppers in paddy fields, as well as on locusts control.

— The national fishery environment monitoring network has been set up.

— An national programme on forest-fire control has begun implementation, involving the setting up of networks for forest-fire forecasting and early-warning networks for fire behaviour monitoring and for fire behaviour communication, networks of fire isolation passway, as well as the setting up of professional fire brigades with improved fire-fighting equipment.

— According to the survey conducted in 1992, more than 2400 county-level stations for forest diseases and insect pests prevention, control and quarantine had been set up, staffed with 11 thousand professionals. From 1979 to 1991, an accumulated area of 46 million *ha* of forests was protected, thus having controlled the rising tendency of forest diseases and pests.

— 4.2 million *ha* of grassland are annually under prevention and control, accounting for 21% of the area affected by pests and rodents.

Section 2 The Non-engineering Undertakings

China's non-engineering undertakings related to disaster reduction include: the establishment of systems for disaster monitoring, assessing, forecasting and early-warning (see Chapter Four); land use programming; disaster and risk zoning and disaster reduction programming; disaster insurance; disaster rescue and relief; disaster reduction through application of relevant science and technology; publicity and education; and legislation.

1. China's Land Use Structure and Programming

According to China's land use programming, by the year 2000, the nation's land use structure will be as follows: arable land under cultivation, accounting for 12.9%; garden land, 0.9%; forest land, 23.3%; grassland, 27.6%; water area, 3.9%; land for human settlement and industries, 2.4%; land for communication purposes, 0.9%; and unused land (usually with difficult terrain features), 28.1%. Thus, it can be seen that the proportion of land that can be specifically used for disaster reduction engineering projects is extremely limited. Therefore, even greater efforts should be made to control a rapid growth of population, so as to reduce the pressure on the land resources and to mitigate the losses from natural disasters.

2. Zoning of Natural Hazards and Risk, and Disaster Reduction Programming

The zoning of natural hazards and risk, and disaster reduction programming are conducive to avoiding heavy losses from disasters and giving guidance to the relevant prevention, monitoring, forecasting, combating and relief activities. On the basis of enhancing the zoning, risk assessment and programming relating to individual categories of natural disasters, China has actively initiated and stressed the regional integrated programming related to the zoning and risk assessment, and integrated programming on natural disasters reduction.

The Third Generation Seismic Intensity Zoning Map(1990) which was approved in 1992 by the State Council (i,e. the Central Government), provides the basic data for the nation's economic construction and land use, and also offers a basis for designing earthquake-combating works for industrial sites and civil-engineering construction in general. Besides, the nation's formulation of the zoning of agricultural, meteorological and ecological disasters, the zoning of flood and storm risks, of agricultural insurance and of forest-fire insurance have

provided data useful to the construction, development, input and disaster reduction undertakings, in the corresponding fields.

From the viewpoint of a comprehensive study, the following are areas of comprehensive high risks of natural disasters: the coastal areas of southeastern China, the lower Yangtze and Huaihe River valley, northern China plains, northeastern plains, the Sichuan Basin, the areas where farmland and pastures meet in a zig-zag pattern in north China, and the areas along the middle and lower reaches of great rivers, lakes in the eastern part of China. On the basis of the above-mentioned data, China is now formulating integrated national disaster reduction plans.

3. Natural Disaster Insurance

China's insurance undertakings have played an important role in regional disaster reduction, especially in damage prevention, disaster losses mitigation and in post-disaster production-recovery.

— Since resuming its business in 1980, the People's Insurance Company of China has borne substantial risk responsibilities, with its insurance amount having increased from 140.8 billion *yuan* in 1980 to 6167.5 billion *yuan* by the end of 1992. Agricultural insurance, which was initialled by PICC in 1982, has now covered nearly 100 types of risks, thus playing a useful role in dispersing and mitigating risks.

— Ministry of Civil Affairs has also sponsored disaster relief cooperative insurance in the rural areas, which is under trial implementation in more than 100 counties.

4. Natural Disaster Relief

Disaster relief is not only a major post-disaster task of the Government to minimize losses but also an undertaking that has direct bearing on disaster reduction involving thousands upon thousands of households.

— For an average year, the Central Government allocates 1.4 billion *yuan* of relief funds, 1.5 million tons of relief grain and a large quantity of cement, steel, timber, and other materials for disaster relief. In the case of the 1991 extraordinary flooding disaster in eastern

China, more than 60 million people across the country participated in the relief operations, 8 million disaster victims were safely migrated, 7.5 million tons of grain and 30 billion *yuan* were mobilized and duly distributed for disaster relief purposes.

— Over the past 40 years, the People's Liberation Army (PLA) of China has actively participated in the nation's disaster relief, having been engaged in 4.1 hundred thousand disaster-relief operations, with the accumulated participation of 17.99 million persons of the armed forces, 110000 cruises of airplanes and naval vessels, and 13.34 million numbers of runs of vehicles. And in these relief operations the PLA has rescued and helped migrate or transfer 4.15 million disaster-stricken people and 34.58 million tons of goods and materials in the disaster-stricken areas.

5. Natural Disasters Reduction by Relying on Science and Technology

The Chinese Government has all along attached great importance to reducing natural disasters by relying on relevant science and technology. In this connection the Government has set up over 100 disaster-reduction research institutions across China, and has incorporated subjects and projects on natural disaster reduction into the various science key-programmes and long-term programmes of scientific research. These include:

— The study of integrated prevention and control technology and know-how on crop diseases and insect pests;

— The study of integrated prevention and control of forest-fires;

— The study of digital forecast of marine disastrous environments and key technologies on the study in off-shore waters;

— The study of monitoring and forecasting technologies on typhoons, torrential rains and other disastrous weather.

— The study of key technologies on seismic and geological disasters and disaster reduction in urban areas;

— The study of global climate change prediction, the related impact assessment, and the

response policies and measures;

— The study of water resources of the Yellow River;

— The disaster remote-sensing study;

— The study of the formative causes, and patterns of major types of natural disasters, and their monitoring and risk assessment;

— The R and D and application of flood-prevention remote sensing and related early warning system, and the technological study of prevention and control of landslide and mud-rock flows;

— Urban programming against earthquakes and other disasters, and the study of urban integrated disaster reduction engineering works;

— Relevant Government Ministries and local governments have also formulated a series of scientific and technological projects on disaster reduction.

6. Publicity, Education and Legislation in Disaster Reduction

— China's publicity on disaster reduction is carried out mainly at the following two levels: One is mass-oriented, aiming at enhancing their knowledge of and capability for disaster prevention and disaster reduction, by making full use of existing mass media to hold popular knowledge-contests, to exhibit and show relevant popular-science telefilms and to publish easy-reading articles to improve the people's disaster reduction awareness. The other level is of a more professional nature, and involves the publishing of special disaster reduction magazines and collections of relevant essays, which are also being exchanged among domestic and foreign professionals engaged in disaster reduction.

— In recent years, China has attached importance to education in natural-disaster reduction. She has introduced basic and special curricula on disaster reduction into such faculties in institutions of higher learning as geoscience, construction engineering and water conservancy engineering, where postgraduates doing master or doctoral degrees on disaster reduction are educated. The nation has, moreover, set up specialized Disaster Reduction Colleges, which

include disaster risk-management specialties. In addition, general knowledge of disaster reduction has been incorporated into the courses of geography and of basic natural science in the middle schools and primary schools. And public education in disaster reduction has been conducted and supplemented, in some places, by rehearsals on disaster reduction. All this has contributed to raising the disaster reduction awareness of the general public.

— Various relevant departments have increasingly attached importance to disaster-reduction legislation. Laws and regulations on some categories of disasters have been promulgated, or are being drafted or amended.

7. Shortcomings in the Nation's Disaster Reduction Undertakings

Though China has achieved great progress in disaster reduction there are a number of deficiencies which remain to be addressed, and which are attributable to the nation's relatively weak economic foundation, magnitude of disasters and relatively late start of non-engineering undertakings:

— The financial input for disaster reduction has not kept pace with the nation's socio-economic development.

— Lack of national integrated risk assessment on natural hazards and national or regional comprehensive programmes for disaster reduction. And this is not conducive to the optimal and comprehensive utilization of the nation's natural resources nor to giving full play to comprehensive benefits.

— The implementation of non-engineering disaster reduction measures is still lacking in momentum.

— Further efforts are needed to improve the disaster reduction engineering works against individual categories of disasters, and to improve the early warning systems. Moreover, comprehensive regional disaster-reduction engineering systems in high-risk areas are still lacking.

Chapter Four China's Natural Hazards Monitoring and Early Warning Systems

The nation's monitoring and early warning systems for natural hazards include those for monitoring, analysis and forecasting of various hazards. The disaster information and early warning are issued to the general public as necessary, so as to draw their attention in time to adopt relevant measures for purposes of disaster reduction.

Section 1 The National Hazards Monitoring and Early Warning Systems

Over the past 40 years, departments of the Chinese Government pertinent to natural hazard management, having increasingly strengthened their efforts in building their disaster monitoring and forecast systems, have established their relevant networks, which are playing important roles in disaster reduction. Each of these networks consists generally of the following four component parts: the network for observation of natural hazards, relevant elements and phenomena; the telecommunication system for the real-time collection, transmission and exchange of the observation data; the system for data processing, analysis and diagnosing, modelling and formulation of forecasts or warnings; and the system for services, including the transmission and dissemination of such forecasts or warnings. Each relevant department has its own emphasis in the establishment of networks. Generally speaking, the monitoring and early warning systems relating to sudden or abrupt hazards are relatively more comprehensive, and these relate to meteorology, oceanology, hydrology and seismology.

In addition to the above, a great number of non-governmental or auxiliary observation, monitoring or forecasting stations and their staff workers have started functioning, thereby making up for the deficiencies of the State-run professional stations and networks to some extent. In recent years, China has made remarkable achievements in monitoring floods and waterlogging, droughts, forest and grassland fires, sea ice, desertification, crop diseases and insect pests, landslides, mud-rock flows etc. through the application of aviation/satellite remote-sensing and land-based remote sensing technologies.

Currently, the major real-time data transmission networks of different systems are mostly hooked up through medium-speed transmission links (satellite, wire or microwave), and some are collecting data from observatory stations by means of satellite receiving and transmission. Computers have in the main been applied to automatic real-time dissemination and exchange of real-time data.

The department in charge of management of different categories of natural disasters have established their forecast mechanisms at national, regional (including major river-valleys and sea regions), provincial and prefectural or even county levels, to take charge of the processing, analysis, diagnosing, modelling, forecasting and warning operations. Apart from publicly issuing disaster forecasts and warnings covering the whole country or the relevant big regions, the National and Regional Centres also offer analysis and diagnosing data and various pre-disaster guidance output to relevant operational units, and in the meantime carry out global or trans-national forecasts. The forecast and warning mechanisms below the provincial level are generally in charge of the forecast and warning only within their respective administrative areas.

Section 2 Current Status of Natural Hazards Monitoring and Early Warning Systems

1. Meteorological Observation, Forecast and Warning

— In addition to regular surface and upper-air observation, the meteorological observation and monitoring system also encompasses different multi-functional automatic weather-stations, meteorological radar-sets, weather satellites, meteorological rocket and airplane detection, and these have an effective range from several meters underground to dozens of kilometres or to even higher altitudes. Currently, the meteorological observation and monitoring network in China consists of 2490 surface meteorological weather stations, 957 precipitation observation stations as well as 143 radio-meteorological stations and radar wind-observation stations. Thus the nation's meteorological network density has met the requirements set by World Meteorological Organization(WMO). In addition, the nation has various kinds of weather radar-sets and satellite-information receiving installations currently in use. All in all, about 20000 professionals are now engaged in the nation's meteorological observation and

monitoring networks.

— In respect of weather forecast, on the basis of digital prediction, comprehensive analysis and multiple prediction methods have been used to make long-, medium- and short-term forecasts and imminent forecasts. And the accuracy of these forecasts has been markedly improved.

— The dissemination of forecasts and warnings is mainly conducted through radio-broadcasting and television programmes; automatic telephone services in cities; special telephone responses to weather inquiries; weather forecast and warning broadcasting; warning receivers installed by more than 70000 users; as well as through newspapers and other written materials, etc..

2. Hydrologic Observation and Forecast/Prediction

— While carrying out large-scale water conservancy undertakings, China has also rapidly developed her hydrologic observation and forecast/prediction. Up to the end of 1992, China already had 3172 hydrologic stations, 1149 hydro-metric stations, 15368 precipitation stations, 64 hydrologic experimental stations and 13684 metering wells of underground water in charge respectively of the reporting of hydrologic information on rivers, lakes and reservoirs, with 8843 stations having been equipped with a total of 12000 wireless talkies.

— Currently, all the flood control departments from the central down to the local levels are engaged in the hydrologic forecast/prediction.

3. Marine Observation, Forecast and Warning

— The nation's marine and coastal disaster analysis, forecast and warning system consists of 3 tiers of forecast organizations: the National Marine Forecast Center, the 3 sea regional centers and Hainan Center. They issue forecasts and warnings relating to typhoon storm-surge, temperate-zone storm-surge, sea wave, sea ice, tsunami, and warnings on marine accidents and oil spilling,etc.

— With renovation and upgrading in recent years, marine environment and disaster monitoring networks have carried out automation in their monitoring, observation as well as

in data collection relating to tides, waves and sea temperature. At present, the nation has 60 coastal and island oceanic stations, 10 central oceanic stations, with 30 of these stations having been equipped with automatic wave metering system, 40 with automatic tidal gauge systems. These stations, together with the stations under the Ministry of Water Conservancy and other relevant departments, have formed the national tide-observation network with 104 stations, which are effectively monitoring the coastal storm-surge and the sea-level changes.

4. Seismic Disaster Observation, Prediction/Forecast and Warning

— The seismic precursor observation system is composed of 1300 professional and local stations of 3 different levels, namely the national, regional and provincial levels.

— The main methods to observe and monitor seismic precursors involve application of technologies in the fields of seismic metering, geomagnetism, topographic deformation, the physical and chemical dynamics of underground water, terrestrial electricity, crustal stress gravity, meteorology, ground temperature, and anomalies of living beings.

— China's current state of art in earthquake prediction can be summarized as follows: some, though not all, types of earthquakes can be predicted with a reasonable degree of certainty; long- and medium-range earthquake prediction has attained a degree of reliability, though the successful rate for imminent earthquake predicting is still relatively low.

5. The Observation and Monitoring of Geological Disasters

— The geological disaster monitoring involves the observation and monitoring of landslides, cave breakdown, mud-rock flows, underground water level, subsidence, underground-water contamination and pollution, ground fissure or crock, etc..

— China has set up 3 tiers of geological disaster monitoring stations, namely, the National Monitoring Headquarters; the 30 monitoring stations at the provincial levels, and the 160 sub-stations at prefectural (municipal) levels, with a total staff of 2000 people. In addition, the nation has 19000 subterranean-water monitoring posts or stations.

6. Monitoring and Early Warning of Biological Disasters in Agriculture

— The nation has set up more than 1900 monitoring and forecasting stations which are responsible for the forecasting and warning of crop disease, pests and rodent, with nearly 10 thousand full-time staff members. With the National Plant Protection General Station under the Ministry of Agriculture as the core, the monitoring and forecasting network is responsible for the monitoring, forecasting and warning of major biological disasters caused by plant diseases and pests and by rodents in the country.

— To prevent the importation of dangerous diseases, pests, and noxious weeds and their spread in China, the nation has set up more than 240 animal and plant quarantine posts or stations at the ports of entry in relevant harbours and airports, etc., and has in addition set up more than 1800 plant quarantine stations nationwide, with a total staff of more than 8000 professionals.

7. Monitoring and Early Warning of Biological Disasters in Forestry

— China has established 1898 forestry quarantine stations for forest disease and pests control, with a total staff of more than 8000 full-time workers. The National Center for Forest Disease and Insect Pests Survey takes charge of guiding and coordinating the nation's monitoring and survey work, and issuing disaster information and forecasts.

— The National Center and some provincial stations have established relevant prediction modelling based mainly on statistic methods to conduct the medium and short-term prediction of disease and insect pests, and have achieved tangible results.

8. Monitoring, Forecasting and Warning of Forest Fires and Grassland Fires

— Up to 1993, China has set up ,in her major forest areas, 334 forest-fire prevention stations, 6132 observatory stations and 112 forest-fire risk weather forecast stations, staffed with 540000 full-time and part-time forest guards as well as 10000 forest policemen in the major forest areas and relevant local units. In the State-owned forests in northeastern China and Inner Mongolia and southwestern China, 13 aerial forest protection stations equipped with a total of 60 forest-protection airplanes. In addition, some major fire prevention areas have been equipped with satellite data receiving and processing installations.

— The nation has set up the Grassland-fire Prevention Commanding Headquarters, and the sub-command mechanism in 13 province/autonomous regions, staffed with 10000 full-time and part-time professional fire-fighters as well as 200000 volunteers. A nation-wide fire-fighting information management network is being established. And computer transmission of colour pictures and other satellite-monitoring data has been initiated in the country.

9. Problems and Shortcomings

Thanks to more than 40 year's efforts, particularly to the hard work of the last 10 years, China has established national hazard monitoring and forecast systems with multi-functions of scientific research, data collection, monitoring, analysis and processing of basic data, and has established tens of thousands of observation/monitoring stations staffed with hundreds of thousands of professional people. Great achievements have been made, however some shortcomings remain to be improved or resolved.

— The above-mentioned monitoring, forecast and warning systems have respectively their own system aimed at addressing one single category of disasters or an individual disaster respectively. Therefore, there has been duplication of efforts for instance, each having its own telecommunication system for each category of disasters, and its own installations for collecting meteorological information relating to various kinds of disasters. And this has not only caused waste in financial resources but also inconvenience in the timely exchange and sharing of information on various kinds of natural disasters and inconvenience in the integrated study of the trends of these disasters.

— The overall technological level of monitoring, forecast and warning systems of various disasters is still lagging considerably behind the advanced levels of developed countries. And there are still some weak links, for instance, problems in the prompt transmission and dissemination of various disaster warnings.

Chapter Five International Cooperation in Disaster Reduction

Section 1 China's Positive and Responsible Attitude towards International Cooperation in Disaster Reduction

Natural disasters, being a kind of serious constraints on socio-economic development, are a great challenge to the international community. Disaster reduction is a great undertaking which is a basic policy that has great bearings on people's livelihood and the prosperity and wellbeing of a country, and which serves the interests of future generations and, indeed, of mankind as a whole. Therefore, reduction of the adverse impacts of natural disasters is a common responsibility of humankind and calls for the concerted efforts and close cooperation of all nations.

The Chinese Government has always attached great importance to the international cooperation in disaster reduction and is deeply aware of her obligations as a member of international community, accounting for 1/5 of the world's population and encompassing a vast territory. China's historical, geographical, cultural and socio-economic conditions make it possible for her to play a unique role in international disaster reduction activities:

— Most parts of China are located in the joint areas between the two regions where natural disasters of various types occur, with very high frequencies. These being rather typical in the world, offer a best venue for conducting study of natural hazards.

— China is densely populated and her national economy is in the stage of accelerated development. For many years, with relatively limited financial input, China has been engaged in disaster reduction and have accumulated substantial experience in promoting what is beneficial and minimizing what is harmful caused by natural disasters, thereby promoting the nation's sustained socio-economic development. Such experience can be of some value to other developing countries, especially to those in Asia.

— Having a very long history, China has in store a wealth of disaster-related information in her various historical documents. A thorough screening and analysis of such historical information will provide valuable information sources for discovering the objective laws

governing the occurrence and trends of natural disasters, and provide some scientific basis for predicting the relevant disasters in the Asian and Western Pacific-rim region.

China has scored tangible achievements in disaster reduction which have won the attention of and favourable comments from the international community. China is ready to introduce her relevant experience to other countries and to strengthen cooperation with them in disaster reduction. Meanwhile, as a developing country, China is aware of the gap between her state-of-art and that of developed countries. And China is ready to learn from the advanced experience, effective management and methodologies, and advanced technologies from other countries in disaster reduction. True, China's disaster reduction undertakings will, as always, depend primarily on her own efforts. However, as a developing country with a vast population, extensive disaster-stricken areas, and with natural disasters occurring frequently and bringing heavy losses--a developing country which is still at an initial stage of national economic development, China needs international cooperation in respect of preventing natural disasters and reducing their damage. Through such international cooperation, China hopes to make new contribution to the global disaster reduction undertakings in the interests of mankind as a whole.

Section 2 China's International Cooperation in Natural Disaster Reduction

1. History and Current Activities

The cooperation relating to disaster reduction between China and relevant UN organizations and agencies dated back to 1972 when China restored her legitimate seat in World Meteorological Organization(WMO). Since 1977, following China's participation in UNESCO Intergovernmental Oceanographical Committee(IOC) and Hydrological Programm, China's international cooperation in disaster reduction has been unfolded extensively.

— In mitigating drought, 13 large-scale agricultural water-conservancy projects have been implemented by using the 1.3 billion dollar loans from the World Bank.

— In mitigating damage from earthquakes, in cooperation with World Bank and UNDP, a number of seismic-monitoring networks and experimental sites, have been established, including the project on the Upgrading of Seismic Network in the National Capital Area.

— In forest-fire prevention, with the financial support from the Canadian Government and loans from the World Bank, a modern fire-prevention system in northeastern China to harness forest fires has been established.

— In disaster relief, from 1988 to 1989, China on the one hand donated 7 million *yuan* to more than 40 developing countries through World Meteorological Organization. On the other hand China has dispatched experts to some requesting countries to help formulate disaster reduction plans, and has participated in the Integrated Global Ocean Services System (IGOSS) and Global Ocean Observation System (GOOS), and has hosted quite a few workshops and conferences on natural disaster reduction.

— In prevention and control of crop diseases and pests, FAO cooperated with China in implementing the 1988 approved project on the Integrated Pest Management(IPM) of rice diseases and insect pests, involving the training of 60000 farmers in 14 counties of 9 provinces from 1989 to 1991. And as a result, about 158000 farmers have been mobilized to join in the IPM activities.

2. New Progress in International Cooperation

Since its establishment in 1989, CNCIDNDR has regarded the promotion of international exchanges and cooperation in disaster reduction as an important aspect of its work, with emphasis on non-engineering undertakings, such as the study and programming of comprehensive disaster reduction and the disaster relief relating to major natural hazards.

— Since 1989, while increasing China's participation in comprehensive international conferences and meetings on natural disaster reduction held abroad, China has hosted 21 large-scale conferences on disaster reduction. These have not only helped China to know more about the new progress and new experience in international IDNDR activities, but have enabled China to make her share of contribution to the IDNDR.

— Following the occurrence of severe flood in eastern China in 1991, the Chinese Government for the first time in history appealed to the international community for urgent relief assistance, and received considerable donations of funds and relief-supplies from more than 60 international organizations and foreign countries, as well as from Hong Kong and Macao.

— China has in recent years obtained loans from the World Bank for flood control and for river harnessing and management in some lesser river valleys.

Section 3 China's Principled Position on Strengthening International Cooperation in Disaster Reduction

The Chinese Government holds that international community should further strengthen cooperation in disaster reduction. While making concerted efforts in mitigating natural disasters, it is necessary to take into account the following basic principles:

— It is essential to closely integrate disaster reduction with socio-economic development. Only by mitigating the negative effects of natural disasters in the course of development, can national economic construction achieve optimal benefits. And, only with progress in socio-economic development, can mankind enhance their overall capability in preventing and combating natural disasters.

— National effort at disaster reduction should be combined with the disaster reduction activities of the relevant region or subregion. As some disasters tend to affect many countries and region, it is hardly possible for one individual country or region to effectively mitigate such disasters. Therefore, to carry out international cooperation in disaster reduction in the relevant regions or subregions is of great importance to both the global programme and the national activities on natural disaster reduction.

— Disaster reduction should primarily depend on self-reliance and national efforts, however, intensified international cooperation is vital, especially to developing countries, whose economies are not well-developed, whose science and technology levels are generally backward, and who are caught in the vicious circle of backwardness and heavy losses caused by frequent natural disasters usually of a trans-boundary magnitude. Therefore, developed countries and international organizations/agencies should provide the requisite assistance to help the developing country in disaster reduction and to promote their socio-economic development. This is in the interests of both the developing and the developed countries.

— The national policy, programme and priority in disaster reduction formulated by each country must be fully respected. As countries differ in national conditions, economic development level, cultural background and historical traditions, it is a country's sovereign

right to decide on her own disaster-reduction policy and priorities in accordance with her country-specific conditions and the realities of her socio-economic development. And this sovereign right, too, should be fully respected.

Section 4 China's Expectation for World Conference on Natural Disaster Reduction and the IDNDR

1. World Conference on Natural Disaster Reduction

China actively supports the convening of the World Conference on Natural Disaster Reduction in Yokohama, Japan in May 1994. In China's view, the convening of the Conference, which reflects the great importance attached by the international community to the issue of disaster reduction, will have a far-reaching impact upon both the disaster reduction undertakings of the world and socio-economic development. And China hopes that the Conference will meet the following expectations:

— The Conference will reach a common understanding on natural disaster reduction and development, and will adopt a document which fully reflects the views of all parties and which will provide guidance to international disaster reduction undertakings and development for the coming five years.

— Practical international cooperation in disaster reduction will be intensified. In this connection, developed countries will provide substantial financial resources and technological assistance to help developing countries mitigate natural disasters, will adopt practical measures to improve the international economic environment which has been unfavourable to the developing nations, and will assist the latter in their efforts at socio-economic development and S & T advancement, so as to substantively help enhance their capability in preventing and mitigating natural disasters.

— Relevant international organizations/agencies should play even greater roles in international disaster reduction. Coordination and cooperation among them and with the disaster-affected countries should be strengthened and work efficiency should be further raised.

The Chinese Government has attached great importance to this conference. China has taken

part actively in the preparations for the Conference and has set up the national preparatory group for World Conference on Natural Disaster Reduction, with the participation of CNCIDNDR, State Planning Commission, State Economy and Trade Commission, Ministry of Civil Affairs, Ministry of Foreign Affairs, Ministry of Finance, Chinese Academy of Sciences, State Seismological Bureau etc. to coordinate the relevant work, with the cooperation and help of other departments concerned.

2. IDNDR

Since UN adopted its Resolution on launching the IDNDR in 1988, the international community has made notable progress in both awareness of and practice in disaster reduction. Whether a good job can be done to implement IDNDR in the remaining years of this century is an issue which has direct bearings on whether there will be a good beginning of world disaster reduction undertakings in the 21th century. In this context, our hopes are inter alia the following:

— Recognizing that natural disaster reduction calls for concerted actions of the world, the IDNDR Committee and developed countries should give priority consideration to increasing their financial support and technological and equipment assistance to developing countries.

— Global or regional funds for disaster reduction can be established through the joint contributions from relevant UN agencies and developed countries.

— It is hoped that IDNDR Committee can promote and facilitate the exchange and sharing of management expertise and of relevant science and technology, and set up a Disaster Reduction Information Center for the Asia-Pacific Region;

— IDNDR can initiate the establishment in China of some international demonstration projects on disaster reduction, so as to promote further development of disaster reduction undertakings.

Chapter Six China's Disaster Reduction Programmes

Section 1 China's National Goals and Strategies of Disaster Reduction

1. National Goals of Disaster Reduction

— Minimizing economic losses, human casualties from natural disasters and their adverse impacts upon national economy and social development.

— Formulating the overall national and key regional programmes for disaster reduction, increasing the financial input, and implementing part of the programmes as appropriate.

— Setting up a national comprehensive management and coordination mechanism for disaster reduction to improve the nation's disaster management system.

— Improving and further developing the disaster monitoring, warning and telecommunication system for the nation and key regions to further enhance the capability of contingency response.

— Setting up comprehensive analysis and assessment system at the national level for key regions; improving the capability of collecting, processing and transmission of disaster related information; improving the disaster-related data base at the national, local and sectoral levels.

2. China's Strategy of Natural Disaster Reduction

— The guiding principle of China's strategy to mitigate natural disasters is: in the light of China's country-specific conditions and proceeding from the need to promote sustainable economic development and social stability, to minimize losses and human casualties caused by natural disasters.

— Increasing the financial input for disaster reduction and enhance the comprehensive

ability of the government in disaster reduction management through appropriate institutional and financial support.

— Implementing a number of key projects and integrated pilot projects in areas that are of great significance to national economic development and social progress, focusing on those categories of natural disasters which are capable of causing severe losses.

— Mitigating natural disasters by relying on application of relevant science and technology.

— Further expanding mass education in disaster reduction and publicity in this regard.

Section 2 Action Plan for the Second Half of the Decade

Adhering to the principle of "Promoting what is beneficial and minimizing what is harmful", and the step-by-step approach "from the easier to the more difficult", China is ready to continue taking part in relevant activities for the second half of the decade-IDNDR.

1. Non-engineering Undertakings

— On the basis of the experience gained over the first half of the Decade, continuing to incorporate disaster reduction into the overall national plan for socio-economic development, and to increase financial input for disaster reduction progressively in pace with the progress in national economic development.

— Setting up a national center on natural disaster reduction to conduct comprehensive analysis and assessment of the nation's various types of natural disasters.

— Establishing step-by-step more than 10 national and provincial education and training bases as well as 10 demonstration models across the country.

— Formulating laws and regulations on disaster reduction and further raising public awareness of disaster reduction.

— Developing and improving disaster related information collecting and processing systems

and the comprehensive satellite application system, developing the dissemination system of disaster warning.

— Carrying out geological pre-disaster survey in the big cities and zonal construction areas of the eastern coastal region; and conducting disaster survey and research into response measures in regions prone to severe geological disasters.

— Conducting research into technologies on seismic isolation, mitigation and control, and promoting their application.

2. Engineering Construction

— Continuing with the construction of physical infrastructure in water conservancy and sea-dike, such as the large-scale water-conservancy key engineering projects at the Three Gorges of the Yangtze River and Xiaolangdi of the Yellow River as well as the comprehensive flood-control engineering works of the Huaihe River and Taihu Lake catchment area.

— Raising the capability of flood prevention and seismic resistance in urban areas.

— Raising the comprehensive disaster prevention capability in large and medium-sized enterprises.

— Bringing major geological disasters under comprehensive prevention and control.

— Raising the overall control areas free from crop disease and pests from the current 10% to 20% in the field of agricultural production (of paddy, cotton, vegetables, etc.),from 40% to 60% in the case of forest, and from 21% to 35%in the case of grasslands.

— Completing the on-going construction of the 5 shelter-forest systems by an increase of 15 million *ha* of additional afforestation, expanding the acreage of grass-planting to a total of 13 million *ha*, expanding the area of desertification prevention and control by 4 million *ha*, increasing the Taihang Mountains Greening Projects (additional tree-planting and grass-planting) by 3 million *ha*, and basically implementing the programme whereby the fire-brigades in forest areas and grasslands will be staffed with trained professionals and will be well-equipped.

Section 3 Priority Areas of International Cooperation in Natural Disaster Reduction

1. Re. Basic Study on and Implementation of Natural Disaster Response Measures:

— Study of the impacts of natural disasters on China's economic and social development;

— Formulation of the nation's integrated disaster reduction programme;

— Establishment of a national center for natural disaster management;

— Establishment of the National Data Base on Natural Hazards.

2. Re. Education and Training for Natural Diasters in China and the Asia-Pacific Region:

— Formulation of plans for education and training programme in China and the Asia-Pacific Region;

— Establishment of a training centre on disaster reduction for China and the Asia-Pacific Region;

3. Formulation of Demonstration Projects on Disaster Management at Provincial, Prefecture and County Levels;

4. Joint Cooperative Plan for Observation and Warning of Natural Hazards with Asia-Pacific Countries and the International Community as a whole.

Fig 1 Distribution of Central Places for Major Natural Disasters in China (1900-1992)

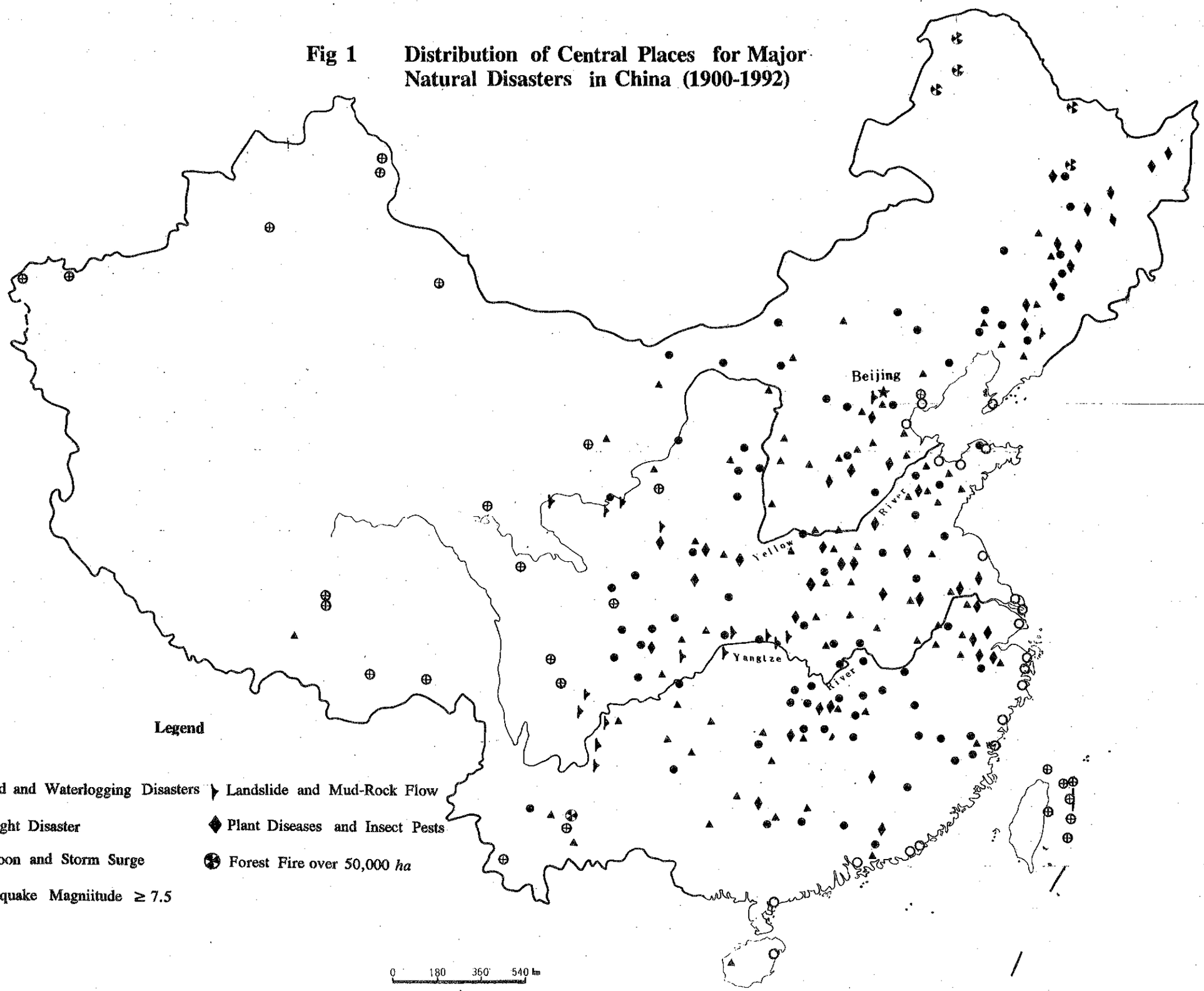
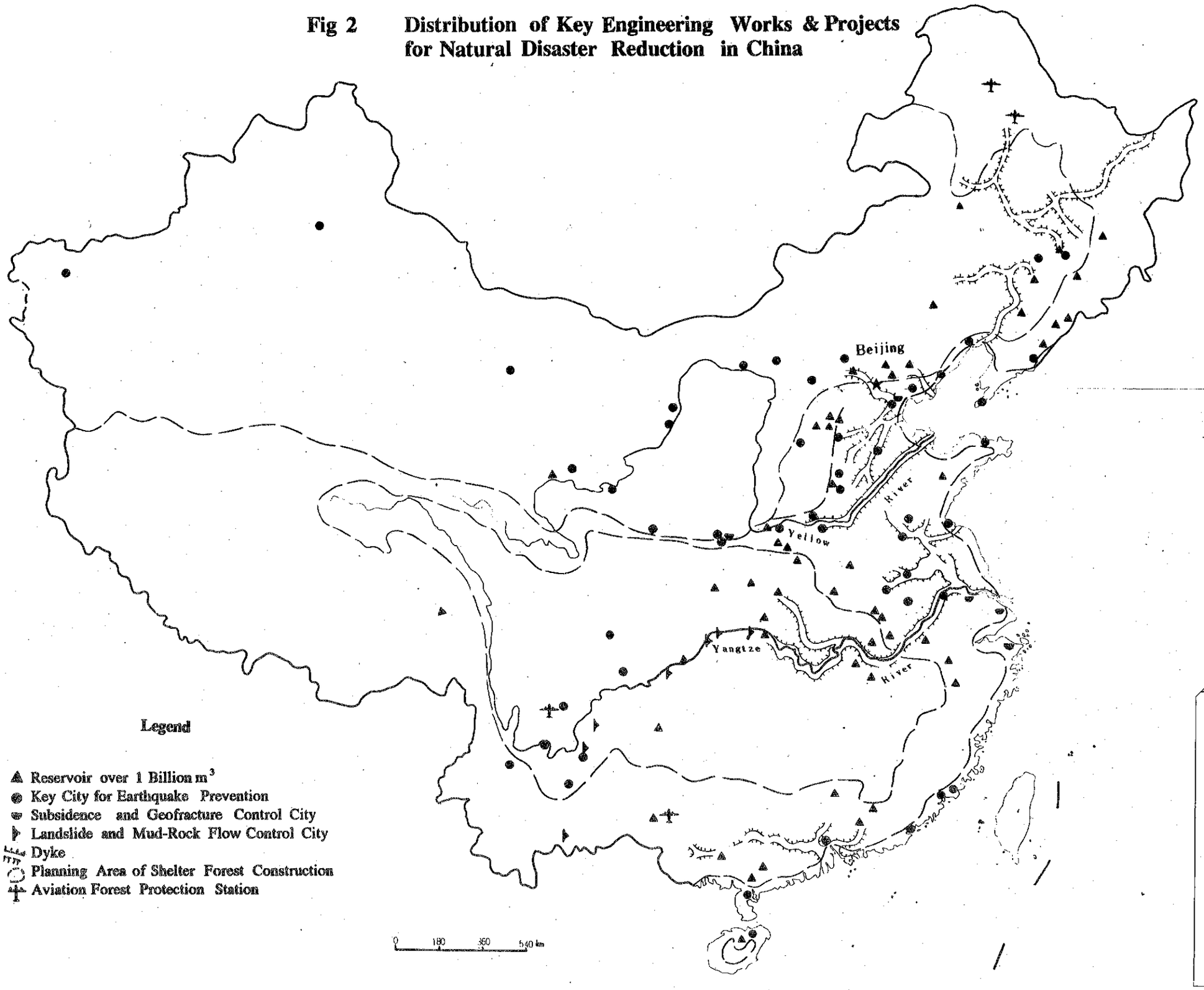


Fig 2 Distribution of Key Engineering Works & Projects for Natural Disaster Reduction in China



ANNEX

Immediately after the first circular note on World Conference on Natural Disaster Reduction by IDNDR Secretariat, the Chinese Government decided to start the preparation of the National Report and, for this purpose, designated China National Committee for the IDNDR (CNCIDNDR) to coordinate the undertaking. In November 1993, a Leading Group for the National Report, composed of relevant officials from CNCIDNDR, Ministry of Foreign Affairs, the State Planning Commission, the State Science and Technology Commission, Chinese Academy of Sciences, State Seismological Bureau, etc. was set up to take charge of the organization work relating to the compilation of the report and to give guidance to its drafting. Under this leading group a drafting group was established, whose members included those from relevant administrative departments of the Government and representatives from relevant scientific and educational circles. On this basis, a standing drafting group was set up drawing upon expertise from CNCIDNDR, Ministry of Foreign Affairs, Chinese Academy of Sciences, State Oceanic Administration, Beijing Normal University and Beijing Aviatorial and Aerospace University, etc..

In order to ensure that the Report presents an accurate picture of the past, present and future of China's efforts at natural disaster reduction, the standing drafting group has held six meetings to solicit views from the Leading Drafting Group, 28 member organizations and also from relevant experts and scholars. Thus, the Report was redrafted and substantially amended four times before its finalization.

List of Participating Organs and Members for Preparation of *National Report of the People's Republic of China on Natural Disaster Reduction*

Leading Group

Head of the Group:

Fan Baojun	Vice-Chairman & Secretary-General of CNCIDNDR, and Vice-Minister of Civil Affairs

Deputy Head of the Group:

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Members of the Group:

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Wang Yong	Deputy Director, Social Development Dept., State Science and Technology Commission
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Ma Zongjin	Head of National Working Group on Natural Disasters Sponsored by SSTC, SPC and SETC, and Director of Institute of Geology, State Seismological Bureau
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Institutions and Organizations which Have Participated in Discussion on the Drafts of the National Report

Ministry of Foreign Affairs, State Planning Commission, State Economy and Trade Commission, State Education Commission, State Science and Technology Commission, Ministry of Public Security, Ministry of Civil Affairs, Ministry of Finance, Ministry of Geological and Mineral Resources, Ministry of Construction, Ministry of Railways, Ministry of Communication, Ministry of Posts and Telecommunications, Ministry of Water Conservancy, Ministry of Agriculture, Ministry of Forestry, Ministry of Interior Trade, Ministry of Foreign Economic Relations and Trade, Ministry of Broadcasting, Film and Televisions, Ministry of Public Health, Chinese Academy of Sciences, China Meteorological Administration, State Oceanic Administration, State Seismological Bureau, China Red Cross Society, National Natural Sciences Foundation of China, the People's Insurance Company of China, the Headquarters of General Staff of People's Liberation Army, State Statistics Bureau, Chinese Academy of Social Sciences, etc.

Appendix:

SUMMARY REPORT

OF THE PEOPLE'S REPUBLIC OF CHINA

ON NATURAL DISASTER REDUCTION

SECTION A: PROFILE

1. China National Committee for the International Decade for Natural Disaster Reduction

China National Committee for the International Decade for Natural Disaster Reduction (hereafter referred to as CNCIDNDR) is an inter-ministerial organization that takes charge of the formulation of principle policy and action plan for IDNDR activities in China, organizes and coordinates relevant departments, NGOs and mass media in making concerted efforts to launch IDNDR activities, gives guidance to local government in their disaster reduction undertakings. The Committee is composed of the following 28 organizations:

Ministries(Commissions, Bureaus)[23]:

Ministry of Foreign Affairs(MFA)
State Planning Commission(SPC)
State Economy and Trade Commission(SETC)
State Education Commission(SEC)
State Science and Technology Commission(SSTC)
Ministry of Public Security(MPS)
Ministry of Civil Affairs(MCA)
Ministry of Finance(MF)
Ministry of Geological and Mineral Resources(MGMR)
Ministry of Construction(MCon)
Ministry of Railways(MR)
Ministry of Communications(MCom)
Ministry of Posts and Telecommunications(MPT)
Ministry of Water Conservancy(MWC)
Ministry of Agriculture(MA)

Ministry of Forestry(MFor)
Ministry of Interior Trade(MIT)
Ministry of Foreign Economic Relations and Trade(MFERT)
Ministry of Broadcasting, Film and Television(MBFT)
Ministry of Public Health(MPH)
China Meteorological Administration(CMA)
State Oceanic Administration(SOA)
State Seismological Bureau(SSB).

Non-Governmental Organizations[1]:

The China Red Cross Society(CRCS).

Academic & Research Institutions[2]:

The Chinese Academy of Sciences(CAS)
National Natural Sciences Foundation of China (NNSFC).

Insurance[1]:

The People's Insurance Company of China(PICC).

Others[1]:

The Headquarters of General Staff of the People's Liberation Army(HGSPLA)

2.Internal Organization of CNCIDNDR

CNCIDNDR has designated: 1 Chairman held by one State Councillor (vice premier level), who takes charge of the overall work; 6 Vice-Chairmen, of whom 1 Executive Vice-Chairman (minister-level) to assist Chairman and takes charge of routine matters; 1 Secretary-General (vice-minister level) in charge of the coordination among the member organizations, 22 standing members who are involved in the discussion, study and decision-making of significant issues relating to the Committee.

Office and Experts' Committee are established under the CNCIDNDR Committee. The Office is the administrative agency (department level) responsible for daily routine matters of the Committee; The Experts' Committee is a consultative body drawing upon prominent experts on various relevant subject matters, who offer disaster reduction advices and are involved in evaluation and judgement of scientific and technical projects and engineering works relating to disaster reduction, and also in the programme formulation and important policy-making on disaster reduction.

3. Prevailing hazards

Type		Location	Affected Population (hds.ml per year)
Atmospheric-Hydrospheric Disaster	Rainstorm and Flood, Waterlogging	Yellow River, Haihe and Huaihe River valleys, middle and lower reaches of Yangtze River; Taihu Lake and northwestern China	2
	Drought	Northwestern, northern and southern China	1.6
	Typhoon; Storm Surge	Coastal areas	2
	Hails	Various areas in China	0.5
	Cool and Freezing Injury	Northwestern, northern and northeastern China, South of Yangtze River	1.7
	Snowstorm	Northwestern, northern, northeastern and southwestern China	1
Geological and Geomorphological Disasters	Earthquake	Northern, southwestern, northwestern China and Coastal areas of southeastern China	1
	Landslides	Some parts of China	0.05
	Mud-rock flow	Some parts of China	0.05
	Soil erosion	Northwestern and northern China	1
	Desertification	Northwestern and northern China	1
Biological Disasters	Disease, Insect pests and Rodent	Various areas in China	1.5
	Vicious weeds	Various areas in China	2
	Red tides	Off-shore regions	1
Forest and Grassland Fires		Forest and pastoral areas of northeastern, northwestern, northern, southwestern China	0.1

4. Natural disasters in the last 3 years(1990-1992)

Type	Location	Affected Population(hds.ml)	Losses (hds.ml *yuan*)
Rainstorm, Flood and Waterlogging	Valleys of Huaihe River; middle and lower reaches of Yangtze River; Taihu Lake; Liaohe and Songhuajiang River Valleys	3	1800
Drought	Northern, southern, northeastern, northwestern China and also South of the Yangtze River	2	450
Typhoon; Storm Surge	Coastal areas	2	210
Cool and Freezing Injury	Northern, northeastern, northwestern, China; South of the Yangtze River	1.7	150
Hails	Various areas in China	0.8	80
Earthquake	Lazi of Tibet Autonomous Region; Pu-er of Yunnan, etc.	0.15	25
Sandstorm	Northwestern part of China like Gansu, Ningxia, Inner-Mongolia and Xinjiang	0.2	17
Plant Diseases, Insect Pests and Rodent	Various areas in China	1	200

5. On national socio-economic conditions

According to the 1992 statistics, China has a population of 1.17 billion; the Gross National Product amounted to 2403.6 billion *yuan*; the income per capita in the urban area was 1826 *yuan*, and the net per capita income in the rural area was 784 *yuan*. The estimated GNP of China in 1993 would exceed 3000 billion *yuan*.

6. Available elements of assistance to other countries in the field of natural disaster reduction

Having a long history of and abundant experience in disaster reduction, China has a scientific and technical staff of a considerable size, including first-class scientists by world standards. And her experience in disaster reduction engineering works, characterized by lower financial input and faster benefits, can be of reference value to other developing countries, and can be exported as a form of technical assistance.

Besides, as most parts of China are located in the joint areas between the 2 regions where

natural disasters of various types occur with high frequencies, these areas are rather typical in the world and are capable of offering good sites and valuable information for conducting studies of global natural disasters.

7. International assistance needed for natural disaster reduction

China is one of the few countries in the world where the heaviest losses caused by natural disasters are recorded. Being now in the process of economic development, China's financial resources for disaster reduction are insufficient and her S & T levels still lag behind those of advanced countries. It follows, therefore, that China needs international assistance in scientific research, applied technologies and, particularly in financial resources in the field of natural disaster reduction.

SECTION B: STRATEGIC MEASURES AND ACTIVITIES

1. Steps towards achieving the 3 main targets of CNCIDNDR

(a) Conducting integrated national risk assessments on natural hazards. On the basis of the existing and relatively scattered risk assessment, CNCIDNDR will conduct integrated risk assessments on natural hazards through organizing and coordinating efforts of all circles across the country.

(b) Formulating mitigation plans at national and local levels. On the basis of current system of disaster management by multi-departments and current plans for different types of disasters formulated by various departments and regions, China will draw up national and local plans for natural disaster mitigation with the integration of preparedness, prevention and relief operations, and will have these incorporated into the overall programming of national socio-economic development.

(c) Developing and improving the existing forecasting and warning systems, China will progressively form an integrated forecasting and early warning system to be linked with relevant international systems.

2. Present national programme for natural disaster reduction

(a) Time frame: 1994 to 2000.

(b) Agencies, institutions and organizations involved: CNCIDNDR and its member organizations, academic research institutions, relevant NGOs and resident agencies of the U.N. system in China.

(c) Implementing agencies: National Government and local government at all levels.

(d) Funds available for implementation: financial resources from the budget of national and local governments, social contributions, donations and financial assistance from the international community.

3. Legislation & Law-enforcement in relation to national disaster reduction

A number of laws and regulations relating to different types of natural disasters have been formulated, which cover many areas but lack integration. Initial preparations are now under way to formulate the nation's integrated legislation on disaster reduction.

4. Disaster mitigation activities underway or completed

a) Identification of Hazard Zones: Hazard Assessment

No	Project Title	Status	National Participating Organizations	Coast (hds.ml. *yuan*)	Sources of Funding	Implementing Agencies	Address of the Agencies in Charge
1	Earlier pre-disaster survey of major geological disasters	from 1991-1993,comple-ted,underway	MGMR; Prov. govts.	0.2/year	Central govt. local govts.	Govts. of provs/munici-palities/ auto. regs.	SPC, No.38, Yuetan Nan Str. Beijing Tel:8501805
2	Zoning map of seismic intensity of China; Geophysical survey in seismic areas and activity fault map	The former completed, the latter underway	SSB	0.1	Central govt. local govts.	SSB	SSB, No.63, Fuxing Rd. Beijing Tel:8215979
3	Remote-sensing monitoring and evaluation on major natural disasters		CAS; MFor; SSB	0.06	Central Govt.	CAS	CAS, No.52, Sanlihe Rd. Beijing Tel:8597531 Fax:8597559
4	Basic research in disaster reduction in cities and in engineering works	to be imple-mented in 1994	Tongji Univ.;Qinghua Univ.; China Research Institute of Construction & Architecture	0.05	Central Govt.	SSB	NNSFC, Huayuan Bei Str. Beijing Tel:2016655

b) Monitoring, Forecasting and Warning

No	Project Title	Status	National Participating Organizations	Costs (hds.ml. *yuan*)	Sources of Funding	Implementing Agencies	Address of the Agencies in Charge
1	Marine environment observation and forecasting system	partly completed	SOA;MWC;MCom.	3	Central Govt.	SOA	SOA, No.1, Fuxingmenwai Str. Beijing Tel:8032211 ext.389
2	Engineering system of forest disease and pest monitoring, forecasting and warning	underway		2.9	Central and local govts.; Inter'l funds	MFor	MFor, Hepingli, Beijing Tel:4213786
3	Weather forecast systems at national regional and prov. levels	bulk completed	CMA; local govts.	2.6	Central and local govts.	CMA; local govts.	CMA, No.46, Baishi Bridge Rd. Beijing Tel:8312277-2682
4	Seismic monitoring and forecasting system	underway	SSB; local govts.	0.8	Central and local govts.	SSB; local govts.	SSB, No.63, Fuxing Rd. Beijing Tel:8219348
5	Monitoring and forecasting system of grassland insect pests and rodent	underway	10 pastoral provs./ auto. regs.	0.2	Central and local govts.	MA	MA, No.11, Agricultural Exbt. Hall Nanli, Beijing Tel:5003366
6	Monitoring and warning system of mud-rock flows		MWC;MA;CAS	0.04	Central govt.	CAS	CAS, No.52, Sanlihe Rd. Beijing Tel:8597531 Fax:8597559

c) Long-Term Preventive Measures

No	Project Title	Status	National Participating Organizations	Costs (hds. ml. *yuan*)	Sources of Funding	Implementing Agencies	Address of Agencies in Charge
1	Reinforcement of existing buildings and facilities that are non-resistant to seismic disasters	underway	Govts. of 30 provs. and 20 plus ministries; enterprises and institutions	30	Central-and-local govts.; enterprises and institutions	Central-and-local govts	MCon, Baiwanzhuang, Beijing Tel:8393376
2	Taihang Mountains greening engineering project	underway	Shanxi;Hebei; Henan and Beijing	26.4	Central and local govts.; Inter'l funds	MFor	MFor, Hepingli, Beijing Tel:4213786
3	Land degradation control and project management	underway	CAS	0.22	Central govts.	CAS	CAS, No.52, Sanlihe Rd. Beijing Tel:8597531
4	Beihou Mount. landslide control in Hanyuan County of Sichuan Prov.	to be completed in 1994	Govt. of Sichuan Prov.	0.17	Central and local govts.	Govt. of Sichuan prov.	SPC, No.38, Yuetan Nan Str, Beijing Tel:8501805
5	Douyapong landslide control in Wanxian County of Sichuan Prov.	1993-1994	Govt. of Sichuan Prov.	0.13	Central and local govts.	Govt. of Sichuan prov.	SPC, No.38, Yuetan Nan Str, Beijing Tel:8501805

d) Short-Term Protective Preparedness and Measures

No	Project Title	Status	National Participating organizations	Costs (hds. ml. *yuan*)	Sources of funding	Implementing Agencies	Address of the Agencies in charge
1	Preplan for imminent-quake & during-quake emergency measures	underway	MPT; MCoal; Govts of Yunnan, Sichuan, Xinjiang, Ningxia, Gansu, Qinghai, Shanxi, Hebei, Beijing	0.5	Central and local govts.	Central and local govts.	MCon, Baiwanzhuang Beijing Tel:8393376
2	Seismic situation monitoring and tracking in the monitoring and preventive area of serious earthquake	underway	SSB; local govts. of all key regions	0.08	Central and local govts.	SSB; govts. of provs./municipalities	SSB, No.63, Fuxing Rd. Beijing Tel:8219384

5. Plans to achieve IDNDR targets by the end of 1999

a) Identification of Hazards Zones: Hazards Assessment

No	Project Title	Status	National Participating Organizations	Costs (hds.ml. *yuan*)	Sources of funding	Implementing Agencies	Address of the Agencies in Charge
1	Seismic risk prediction, prevention and emergency response-measures at national and zonal major areas	underway	SSB; ministries concerned; local govts.	1	Central and local govts.	SSB	SSB, No.63, Fuxing Rd. Beijing Tel:8221108
2	Comprehensive seismic prevention system in the delta area of Yangtze River		MR; MCom; MPT; MWC; govt. of Jiangsu prov.	0.8	Central govt. and govt. of Jiangsu prov.	Central govt., govt. of Jiangsu prov.	SSB, No.63, Fuxing Rd. Beijing Tel:8221108

b) Monitor, Forecast and Warning

No	Project Title	Status	National Participating Organizations	Costs (hds.ml. *yuan*)	Sources of funding	Implementing Agencies	Address of the Agencies in Charge
1	Engineering system of forest fire prevention, monitoring and forecasting	underway	MFor	10.9	Central and local govts.; Inter'l assistance	MFor	MFor, Hepingli, Beijing Tel:4213786
2	China Center for monitoring desertification	to be implemented	MFor	5	Central and local govts.; Inter'l assistance	MFor	MFor
3	Marine disaster forecasting and warning system	partly completed	SOA	2	Central govt.	SOA and govts at coastal area.	SOA,No.1, Fuxingmenwai Str. Beijing, Tel: 8032211-389
4	Monitoring networks for disastrous crops diseases and insect pests	First phase completed; Second phase being implemented	MA, plant protection stations in 10 provs.	1.8	Central and local govts.	MA	MA, No.11, Agricultural Exbt. Hall Nanli, Beijing Tel:5003366
5	Monitoring and forecasting system for grassland fire-prevention	underway	Govts. of the pastoral provs	1.1	Central and local govts.; Inter'l assistance	MA	MA
6	1.Digital seismic station network 2.Seismic information network 3.Dynamic network for monitoring earth transformation	1.under test 2.just started 3.Plan to be finalized	SSB; relevant local govts.	0.4	Central and local govts.	SSB	SSB, No.63, Fuxing Rd. Beijing Tel:8221108
7	Monitoring and forecasting of typhoon and torrential rains and hazards mitigation study	underway	CMA; CAS; SEC	0.25	Central govt.	CMA, CAS, SEC	CMA, No.46, Baishi Bridge Rd. Beijing Tel:8312277-2682

c) Long-Term Disaster-Prevention Measures

No	Project title	Status	National Participating Organizations	Costs (hds.ml. *yuan*)	Sources of Funding	Implementing Agencies	Address of the Agencies in Charge
1	Three-Gorge Dam engineering on Yangtze River	underway	TG Committee of State Council	500.9	Central and local govts	MWC; Hubei prov.	TGCSC,No.39, Yuetan Nan Str. Beijing
2	Mid-line engineering of water channelling from South to North China	to be implemented	MWC; govts. of Beijing, Tianjin, Hebei, Henan, Hubei, Sha'anxi provs. & munics.	226	Central and local govts; Domestic and foreign loans	Leading group of water transport from South to North under the State Council	to be decided
3	Xiaolangdi dam engineering on Yellow River	Underway	MWC;Henan and Shanxi provs.	150	Central and local govts; World Bank loan	MWC	MWC, Baiguang Rd. Beijing Tel:3203161
4	3rd phase of "3-Northern" Shelter Forest System	to be implemented in 1996	Govts. of 13 provs.in north-eastern, northern and northwestern China	140	Central and local govts; Domestic and foreign loans	MFor	MFor, Hepingli Beijing Tel:4213786
5	Shelter-forest system engineering in the upper and middle reaches of Yangtze River	underway	Govts. of Yunnan, Guizhou,Sichuan, Gansu,Qinghai, Sha'anxi,Hubei, Hunan,Jiangxi	110	Central and local govts; Inter'l assistance	MFor	MFor, Hepingli Beijing Tel:4213786
6	Seismic resistance and prevention engineering in new construction works	completed	Local govts. and enterprises located in seismic intensity over VI	100	Local govts.; Enterprises	MCon;	MCon, Baiwanzhuang Beijing Tel:8393376
7	The Huaihe River control engineering projects (18 items)	underway	Govts. of Henan, Anhui, Jiangsu, Shandong Provinces	61	Central and local govts.; World Bank loans	MWC	MWC, Baiguang Rd. Beijing Tel:8393376

No	Project title	Status	National Participating Organizations	Costs (bds.nal. *yuan*)	Sources of Funding	Implementing Agencies	Address of the Agencies in Charge
8	Comprehensive control & management engineering projects of grasslands	underway	28 provincial govts.	61	Central and local govts.; Inter'l funds	MA	MA, No.11 Agriculture Hall Nanli, Beijing Tel:3203161
9	National desertification control and prevention engineering projects	underway	27 provincial /auto regs/ municipality govts.	45	Central and local govts.; Inter'l assistance	MFor	MFor, Hepingli Beijing Tel:4213786
10	Comprehensive Control & management engineering of Taihu Lake	underway	MWC; Jiangsu, Zhejiang and Shanghai govts.	40	Central and local govts.; Inter'l assistance	MWC	MWC, Baiguang Rd. Beijing Tel:8393376
11	Control & management engineering of the lower reaches of Yellow River	underway	MWC; Henan and Shandong govts.	29.5	Central govt.	MWC, Henan and Shandong prov. govts.	MWC
12	Shelter forest systems engineering in the coastal areas	underway	Govts. of 11 provs. in the coastal area	21	Central and local govts.; Inter'l funds	MFor	MFor
13	Shelter forest system engineering of Huaihe River and Taihu Lake	for approval	Govts. of 7 provs. along Huaihe River and Taihu Lake	14.7	Central and local govts.; Inter'l assistance	MFor	MFor
14	Shelter forest system engineering in the Zhujiang River Valley	to be worked out	Govts. of Yunnan, Guizhou, Guangxi and Guangdong	14	Central and local govts.; Inter'l assistance	MFor	MFor

No	Project title	Status	National Participating Organizations	Costs (hds.ml. *yuan*)	Sources of Funding	Implementing Agencies	Address of the Agencies in Charge
15	Engineering project of the 3 big irrigated areas in Sichuan	completed	MWC; Govt. of Sichuan prov.	12	Central and local govts.	MWC	MWC
16	Reinforcement of Jingjiang Dam, Yangtze River	completed	MWC; Govt. of Hubei prov.	3.88	Central and local govts.	MWC and Hubei prov. govt.	MWC
17	Disaster prevention and reduction engineering system in disaster prone pasture areas	underway	Inner Mongolia, Xinjiang, Qinghai, Sichuan, Gansu prov. govts.	2.0	Central and local govts.; Inter'l assistance	MA	MA
18	Seismic prevention and preparedness integrated system in the joint areas of Beijing, Shanxi, Hebei and Inner Mongolia		M.Elec.Power; MR; MPT; MWC; MCoal; MCom; Beijing and Hebei govts.	0.8-1	Same with participating agencies	same with participating agencies	MCon, Baiwanzhuang Beijing Tel:8393376
19	Management of Risk Rock of Lianziya and Huanglashi Landslide in "the 3-gorge" area of Yangtze River.	1993-1997	MGMR	0.9	Central govt.	MGMR	SPC, No.38 Yuetan Nan Str. Beijing Tel:8501805
20	Landslide control in Yuanyang county of Yunnan prov.	1992-1995	Govt. of Yunnan prov.	0.57	Central and local govts.	Yunnan Provincial govt.	SPC
21	Ocean-data buoy network	part completed	SOA. local govts. of the coastal area	2	Central govt.	SOA	SOA,No.1 Fuxingmenwai Str. Beijing, Tel:8032211-389

d) Public Education and Information

No	Project Title	Status	National Implementing Organizations	Costs(hds. mil.*yuan*)	Sources of funding	Implementing agencies	Address of the Agencies in Charge
1	Scientific and technical training center on coastal shelter belt disaster reduction	to be implemented	Govt. of Guangdong prov.	0.08	Central and local govts. Inter'l assistance	MFor	MFor, Hepingli Beijing Tel:4213786
2	South China Centre for forest fire prevention	to be implemented	Govt. of Yunnan prov.	0.08	Central and local govts, Inter'l funds	MFor	MFor
3	South China Experimental center for forest plant quarantine	to be implemented	Govt. of Guangdong prov.	0.06	Central and local govts, Inter'l funds	MFor	MFor

SECTION C: INTERACTIONS

(International Involvement in the IDNDR)

1. Publications on IDNDR-related subjects

1.1 Books

(1) Sun Guangzhong, Wang Angsheng, Zhang Peiyuan, "Natural Hazards in China" (English and Chinese versions), 280 pp, China Academic Publication Press, Beijing, 1990.

(2) Academic Dept. of China Association of Science and Technology, "Study of Natural Disaster Reduction in China", 664 pp, China Science and Technology Press, Beijing, 1991.

(3) China National Committee for the IDNDR and Ministry of Civil Affairs, "Combat Floods in China", 224 pp, China Society Press, Beijing, 1991.

(4) Editorial Committee of China Seismic Resistance and Disaster Prevention, "China's Seismic Resistance and Disaster Prevention", 248 pp, Jilin Arts Press, Changchun, 1991.

(5) China Disaster Prevention Association, "On Disaster Reduction and Development in the Coastal Areas", 242 pp, Seismological Press, Beijing, 1991.

(6) Nanjing Univ., "Collection on Causes of and Response-measures against Natural

Disasters", 558 pp, Editorial Dept. of Journal of Nanjing University, Nanjing, 1991.

(7) Geological Dept. of Chinese Academy of Sciences, "Disaster Effect Analysis and Response-measures in Disaster Reduction", 468 pp, Hubei Science and Technology Press, Wuhan, 1992.

(8) Académic Dept. of China Association of Science and Technology,"Study of Natural Disaster Reduction in China", 455 pp, China Meteorological Press, Beijing, 1992.

(9) The People's Insurance Company of China, Beijing Normal University, "Atlas of Natural Hazards in China" (Chinese and English version), 189 pp, Science Press, Beijing, 1992.

(10) Shi Yafeng, " Geographic Hazards and their Reduction (English version)", 216 pp, Science Press, Beijing, New York, 1992.

(11) Seismic Resistance Office of China Petroleum and Chemistry Corporation, Head Office, "Seismic Resistance of Industrial Facilities", 268 pp, Seismological Press, Beijing, 1992.

(12) J. Lisher, Zheng Zheming, "Tropical Cyclone" (English version), 588 pp, Beijing University Press, Beijing, 1993.

(13) Comprehensive Natural Hazard Study Group under the State Science and Technology Commission, "Major Natural Hazards in China and their Mitigation", 658 pp, Science Press, Beijing, 1993.

(14) Wang Jinfeng, "The Evaluation Method Study of Natural Disaster Effects in China", 213 pp, China Science and Technology Press, Beijing, 1993.

1.2 Magazines

(1) China National Committee for the IDNDR, "Natural Disaster Reduction in China" (Chinese), quarterly publication, China Society Press, Beijing, founded in 1990.

(2) China National Committee for the IDNDR, "Natural Disaster Reduction in China" (English), quarterly publication, China Society Press, Beijing, founded in 1991.

(3) China Disaster Prevention Association, "Journal of Natural Disaster Reduction in China" (Chinese), weekly newspaper, Beijing.

(4) Sha'anxi Provincial Seismological Bureau, Sha'anxi Disaster Prevention Association, "Chinese Natural Hazards Study", quarterly magazine, Xi'an.

(5) Engineering Mechanism Research Institute of State Seismological Bureau, "Journal of Natural Hazards", quarterly publication, Harbin.

(6) China Geological Disaster Society, "Geological Disasters and Their Prevention and

Control" (Chinese), quarterly, Beijing.

2. IDNDR meetings and conferences held or planned to be held in China

(1) "International Academic Workshop on Geological Disasters and their Mitigation," Aug. 21-26, 1990, Nanjing, China.

(2) "International Academic Seminar on Natural Disaster Reduction", May 8-11, 1991, Kunming, China.

(3) "1991 International Exhibition on Technology and Equipments of Disaster Prevention and Relief", Tianjin, China.

(4) "International Seminar on Application of Space Technology in Disaster Reduction", Sept. 23- 27, 1991, Beijing, China.

(5) "The 14th Conference of Eastern Region Public Administration Organization", Oct. 14-19, 1991, Beijing, China

(6) "Sino-Soviet-Japan Workshop on Natural Disasters", Sept. 2-16, 1991, Soviet Union and China.

(7) "International Academic Workshop on Mud-rock Flow and Flood Prevention", Oct. 14-19, 1991, Beijing, China.

(8) "China International Seminar on Geological Disaster Prevention and Control", Oct. 20-25, 1991, Beijing, China

(9) "The Second International Conference on Special Experimental Technic of Typhoon", Nov. 25-29, 1991, Guangzhou, China.

(10) "International Workshop on Heavy Rain, Flood and Waterlogging", Oct. 5-9, 1992, Anhui, China.

(11) "The Second International Conference on Mainland Seismology", Oct. 7-10, 1992, Beijing, China

(12) "International Tropical Cyclone Meeting", Oct. 12-16, 1992, Beijing.

(13) "International Workshop on Erosion, Mud-rock Flow and Environment of Hilly Area", July 5-9, 1992, Chengdu, China.

(14) "Seminar on Science and Technology of Fires in the Asia-Pacific Region", Oct. 9-12, 1992, Beijing, China.

(15) "International Workshop on Climate Change, Natural Disasters and Agricultural Countermeasures", May 26-29, Beijing, China.

(16) "China International Conference on Natural Disaster Management" sponsored jointly by CNCIDNDR and UNDP, June 25, 1993, Beijing, China.

(17) "China Senior Workshop on Disaster Management" organized jointly by CNCIDNDR, Ministry of Civil Affairs and UNDP, June 28-July 2, 1993, Beijing, China.

(18) "The 18th Asia-Pacific Plant Protection Meeting" Aug. 27-28, 1993, Beijing, China.

(19) "The 5th International Workshop on Natural and Man-made Disasters", Aug. 29-Sept. 3, Qingdao, China.

(20) "International Seminar on Sea Ice Disaster", Oct. 19-22, 1993, Beijing, China.

(21) "The 3rd International Meeting on Special Experimental Technic of Typhoon", Oct. 25-29, Shanghai, China.

3. Current or planned partnership and cooperation activities related to IDNDR with other countries.

(1) CNCIDNDR is now, in cooperation with UN disaster management group, formulating China's national Framework for Disaster Reduction.

(2) CNCIDNDR is participating in the disaster training programme (1993-1995) organized by Asia Disaster Preparedness Center.

(3) The Datong-Yanggao Earthquake Rehabilitation and Restriction Project funded by the World Bank loans.

(4) The Taihu Lake Control Engineering assisted by the Asian Bank.

(5) Sino-Swiss Engineering Project of Mianyuan River in Deyang, Sichuan Prov.

(6) The Forest Fire Monitoring and Forecasting System funded by the World Bank loans.

(7) The construction of Yellow River Xiaolangdi Water Engineering Project with funds from the Chinese government and loans from the World Bank loans.

(8) The National Desert Control Engineering with funds from the Central and local governments as well as loans from the World Bank.

(9) IPM project on rice, cotton, vegetables funded by the World Bank loans.

(10) The Cooperative project between China and NACA on aquatic raising and environment.

SECTION D: EVALUATION

1. China's achievements since launching of IDNDR

— Having made preparations, investigation and study for the formulation of national programme on disaster reduction, to be finalized in 1994;

— Having conducted initial analysis and assessment of risks of various natural disasters, with the results being used as reference in the nation's socio-economic development programming;

— Having established a monitoring and forecasting system for various natural disasters, which is being improved progressively;

— Having carried out a series of disaster prevention engineering projects, such as engineering of water conservancy capital construction, seismic resistance and prevention engineering projects, afforestation engineering, etc;

— Having done substantive work in coordinating and organizing disaster resistance and relief operations to minimize losses in life and property and ensure the livelihood of the disaster-stricken people;

— Having launched publicity on disaster reduction, aimed at improving the disaster reduction awareness and knowledge of the general public. Coordinating and organizing the disaster reduction undertakings and carrying out strategic measures by relying on science and technology.

In recent years, the objectives set by CNCIDNDR have been partly fulfilled. However, difficulties still remain due to lack of integrated disaster management and shortage of funds. These have retarded the progress of the formulation of comprehensive disaster reduction plans, the enhancement of comprehensive management, disaster assessment and disaster reduction engineering undertakings. With the nation's efforts and cooperation with international community, China's disaster reduction will be further developed from 1995 to 2000.

2. Review of the IDNDR

— IDNDR is a concerted action of mankind for the first time in face of the challenges of natural disasters. Progress of IDNDR has been made in publicity, education and planning of disaster reduction, in promoting relevant undertakings of every country and international cooperation and exchanges. Disaster Reduction has "stricken root in the hearts of the people"

and enhanced the attention of quite a number of nations.

— The IDNDR has clearly set 3 targets, but the concrete organization and implementation are lacking in momentum. This is because to a great extent some countries and international organizations have not attached enough importance to the activities, and the funds and technologies required for meeting the targets are not yet available.

SUGGESTIONS:

— It is the common duty of all countries to reduce natural disasters, and UN, all international agencies/organizations should give support to the developing countries in funds and technical equipment necessary for major disaster reduction projects.

— It is hoped that IDNDR should promote the exchanges and sharing of management expertise, science and technology, and information among all countries. It is indeed necessary to set up an Asia-Pacific Disaster Reduction Information Center.

— It is necessary to conduct more international training programmes for further improving the disaster reduction awareness and capability of the leading personnel and technicians engaged in disaster reduction. In this context, we welcome setting up an International Disaster Reduction Training Center in China.