

PART III C

Chapter 20

Natural Disasters and Disaster Relief Policy in China

by

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China's disaster prevention, disaster resistance and disaster relief system as well as its social mobilizing system have generally played a crucial role to cope with the losses arising from natural disasters. These systems have effectively eased the damage caused by natural disasters, guaranteed the basic living of people in disaster areas and also maintained the social stability together with the economic development. The frequency and severity of natural disasters in China is however worrying and improving the disaster control system as well as disaster monitoring, early warning, emergency response and recovery management level is not an easy task. In this respect, this chapter provides an overview of the current scheme and policies in place in China and of challenges still to be faced.

* Deputy Division-General.

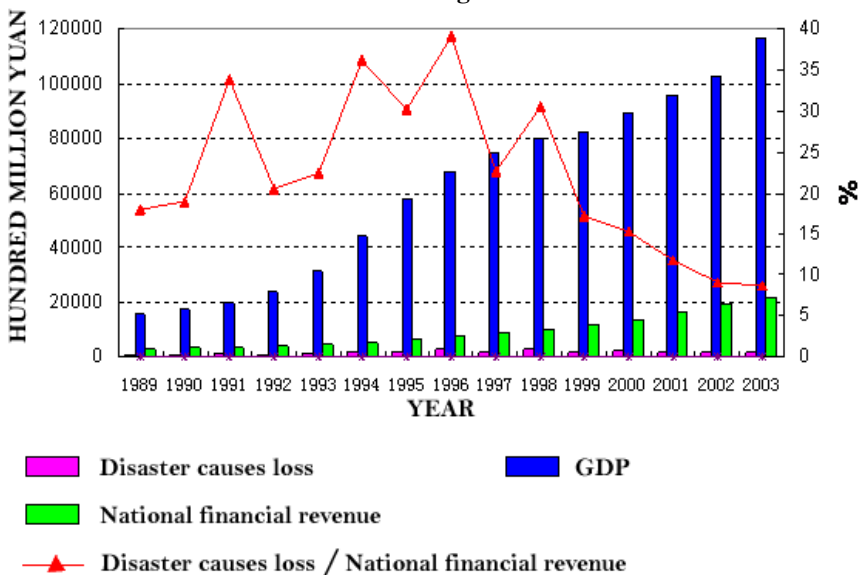
1. The Main Characteristics of Natural Disasters and Its Development Tendency

1.1. The hazardous consequence of natural disasters

Based on their cause, natural disasters can be classified in 5 categories: meteorological disasters, including droughts, floods, tropical cyclones, hails, great rainfalls, rainstorms, sandstorms; geological disasters including earthquakes, landslides, mudflows; oceanic disasters, such as windstorms, hazardous sea-waves; forest and grassland diseases and pests as well as forest and grassland fires.

Frequent occurrence of disasters has caused great losses in the Chinese history. Natural disasters, especially floods, droughts, typhoons, earthquakes, fires and landslides, as well as mudflows, have occurred more frequently since the 1990s and the economic losses have increased greatly. Annually, the population struck by disasters amounts to 370 million, affected agricultural areas to about 50 million hectares and 4.18 million houses are destroyed. The annual population evacuated in emergency amounts to 4 million. and the direct economic losses are more than 100 billion Chinese Yuan, which is 40% more than that in 1980s.

Figure 20.1



Overall, flood, drought and earthquakes are the main natural disasters affecting China and the economic losses caused by them represent 80%-90% of losses caused by all kinds of disasters.

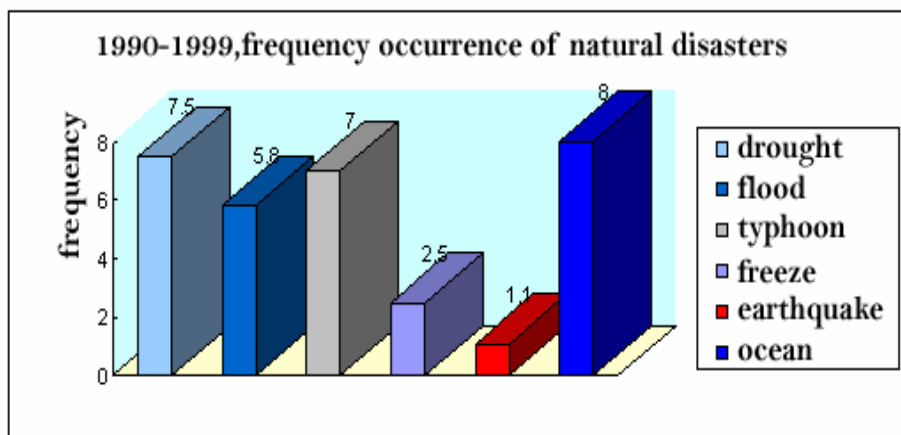
To the world, the disaster situation is in the same picture and the disaster losses have clearly increased from the 1970s to the 80s and the 90s. Although the total number of deaths has decreased from 1.96 million to 0.8 million and 0.79 million, the affected population has increased from 740 million to 1450 million and 1960 million. and the direct economic losses (in the price of 2000) have increased from \$131 billion to \$204 billion and \$629 billion.

According to the analysis of the disaster development tendency, the global climatic change and human activity are the main elements influencing the causes of the disasters.

1.2. The main characteristics of natural disasters in China

Because of the specific geographic and climatic background as well as the social and economic situation in China, there are typical temporal and regional characteristics.

Figure 20.2



1.3. The frequent occurrence of meteorological disasters due to the monsoon climatic situation

The monsoon climate causes considerable temperature and precipitation changes throughout the year, causing frequent floods and droughts in large areas. Snowstorms and low temperatures have also caused great losses in winter. Along the coast areas, the 7-8

typhoons landing annually have caused much loss due to strong winds and rainfall.

1.4. The frequent occurrence of earthquakes due to the location among the three geological areas

China is located at the junction of Eurasia, Pacific and Indian Oceanic areas. This area is also often struck by earthquakes and lines in the Eurasian Earthquake Belt, Himalaya Earthquake Belt and Pacific Ocean Earthquake Ring. In China, Bohai Sea Bay area, Southwestern and Northwestern areas are the most exposed to earthquakes. About one third of all destructive earthquakes in the world during the 20th century happened in China. Since 1949, 477 destructive earthquakes have occurred in China, causing the death of 278 thousand people and injuring 760 thousand. Moreover, the earthquakes have also totally destroyed 6 million houses and caused 42 billion Chinese Yuan of the direct economic losses.

Joint belt of three major plates with frequent earthquakes

China is located at the joint belt of three major plates, namely, the Euro-Asian, the Pacific and the Indian plates, where tectonic movement is quite active. It is also an important distribution range of Euro-Asian, Pacific and Indian seismic belt. Earthquakes frequently affect the circumference of Bohai Gulf, Southwest regions and several provinces in Northwest regions. In the 20th century, destructive earthquakes that occurred in China accounted for one third of all earthquakes in the world. Since 1949, China has been struck by 477 destructive earthquakes, which killed 278,000 people, injured 760,000, and caused damage to 11 million buildings (of which more than 6 million were toppled down). The direct economic losses have reached 42 billion RMB.

Many geological disasters are directly due to the complex topographical condition of China

China, where hilly and plateau areas occupy 69% of all the land areas, is frequently affected by geological disasters: landslides, mudflows etc. According to statistics, geological disasters cause about 1000 deaths every year and the annual economic losses are more than ten billion Chinese Yuan.

The under-development in the high risk areas hinders the improvement of the capacity of disaster mitigation.

The high risk areas are mostly poor areas, especially in the west and middle regions, when disasters make the poor victims poorer and take away the wealth of the others.

Weakness in resisting natural disasters causes even bigger loss

Large population, economic underdevelopment, imbalance in regional economic development and weakness in enduring and resisting natural disasters in rural areas, especially in middle and west regions, are among the main reasons why some regions of China are relatively underdeveloped and some rural residents are still living in poverty or are brought back to poverty. The East part of China and the coastal areas are advanced in development. These areas are however very exposed to and frequently affected by different kinds of natural disasters. Once cataclysmic disasters happen, economic losses are tragic.

2. China's Basic System on Natural Disaster control

On the one hand, China's disaster prevention, disaster resistance and disaster relief system as well as its social mobilizing system have generally played a very crucial role. These systems have effectively eased the damage caused by disasters, guaranteed the basic living of people in disaster areas and also maintained the social stability together with the economic development. On the other hand, the current situation is still serious and sometimes even worse due to unreasonable human activities and environmental degradation. Therefore, it is an arduous task to improve the disaster control system as well as its capability on disaster monitoring, early warning, emergency response and recovery management level.

2.1. Leadership and coordination system regarding disaster control

The basic leadership systems of China's disaster control are: a unified leadership of authorities of all levels, division of work among different sections, classified disaster control, making full use of the armed forces' pioneering function. With regard to China's integrated coordination system for disaster control, at present, under the unified leadership of the state council, the central government has set up many sections in charge of coordinative and organizational work for disaster control. For example: China International Committee for Disaster Reduction, National

Commanding Headquarter for Flood Prevention and Drought Resistance, National Headquarter for Earthquake Resistance and Relief, National Comprehensive Coordination Office for Disaster Resistance and Relief. These sections not only provide decision-making service for the central government but also ensure the timely implementation of decision from central authorities to local levels.

In parallel with the regulated coordination and operation system established from central to local, governments of all levels have their own sections responsible for disaster control. Each section does its own work, cooperates closely with the others and forms a network for disaster control. Personnel, fund and facilities of corresponding sections provide a firm guarantee for starting disaster control work.

2.2. Public Policy on Disaster Emergency Relief

In order to enhance disaster emergency relief capability aiming at all kinds of major natural disasters, the Ministry of Civil Affairs (MCA) has in recent years pushed the implementation of a national emergency pre-planning system for disaster relief. Currently, 17 provinces have already promulgated emergency pre-plans for disaster relief, 80% of the cities and counties have also stipulated such emergency plans. A national emergency preplanning and responding system for disaster relief was fundamentally formulated.

In 2003, the MCA promulgated “Working Procedures In Case of Unexpected Natural Disaster” right in time. This document classifies the responses to unexpected natural disasters into 3 levels according to the scale and severity of each disaster (see table 20.1). It also clarifies detailed working measures for each level and carries out emergency relief works in line with regulated management procedures. Classification measures are as follows:

If a natural disaster occurs in one province (Autonomous Region or municipality directly under the Central Government), and one of the followings appears in a single disaster, the corresponding emergency response will be activated.

Table 20.1 Working procedures in case of unexpected natural disaster

Levels	Mortality (Unit)	People transferred (Ten thousand)	Buildings Destroyed (Ten thousand)	For Destructive earthquakes
3 rd	30—50	10—30	1—10	1. Mortality:20—50 2. People transferred and arranged in urgency: 100,000—300,000 3. Buildings toppled down and damaged: 10,000—100,000
2 nd	50—100	30—80	10—15	1. Mortality:30—100 2. People transferred and arranged in urgency: 300,000—800,000 3. Buildings toppled down and damaged:30,00—150,000
1 st	Above 100	Above 80	Above 15	1. Mortality:50 above 2. People transferred and arranged in urgency: Above 800,000 3. Buildings toppled down and damaged: Above 100,000

Meanwhile, in case of accidents, public health events, social security events or other public emergency events causing casualties and requiring emergency personnel evacuation or relief, the response plan described hereafter shall also be activated.

After activation, the main measures taken by MCA include:

- Gather, assess and understand the disaster situation in time, and provide the population with the necessary information on the disaster and relief works;
- Report to the corresponding agencies on the disaster situation as well as the progress of disaster relief works in time, and coordinate assistance measures to local areas from the central government;
- Dispatch special work groups in time to disaster areas to guide the relief works, supervise local authorities for better implementation of the public policy on disaster relief and to liaise between the MCA and the afflicted local office;
- Distribute emergency relief fund and allocate relief supplies in time to support the local relief activities;
- Adequately organize public donation activities for disaster relief; if needed, mobilize the population to participate in relief works;

- Properly evacuate the victims and ensure their basic living, and guide local authorities to start reconstruction work in time.

The establishment of the above-mentioned response system ensures that emergency relief plans can be activated at any time and that disaster relief personnel, fund and supplies can be in position in the shortest time in case of a disaster. It is initially guaranteed that afflicted people in disaster-struck areas can receive necessary assistance (mainly food, drinking water, shelter, clothes and medical care) within 24 hours. In 2003, about 7.07 million people were urgently transferred and resettled because of a disaster, among which 3 million were temporarily accommodated for more than one month. In 2004, 62 work groups were sent out by the MCA, an amount of 330 million RMB of emergency relief funds was distributed in 22 times and 1.4 billion RMB reconstruction fund was distributed. 2.11 million houses were rebuilt and more than 80 million afflicted people were settled adequately. The basic rights and interests of afflicted people were safeguarded and social stability in disaster-struck areas was guaranteed. During this term, in order to prevent the flood in Huai River and Wei River drainage areas, the MCA timely activated the 1st level of the disaster relief response procedure on July 21st. Throughout the year, the 3rd response was activated 14 times and the duration of response added up to more than 4 months.

2.3. Expenditure of Disaster relief

In recent years, central institutions have further improved the financial subsidy mechanism for disaster-struck areas, in with the fields of agriculture, irrigation, education, transportation, communication, people's life and restoration. At present, central subsidies to local disaster relief work include mainly: living relief fund, sanitation relief fund, flood prevention and drought resistance fund, pre-flood emergency fund, fund for roads damaged by flood, educational and administrative relief fund, agricultural relief fund and reconstruction fund. In 2003, China in all devoted 8.03 billion RMB to disaster relief, of which 4.05 billion came from the MCA and the MOF (Ministry of Finance).

For the living relief fund, the MCA and the MOF arrange relief and subsidy funds for large-scale natural disaster through 3 instruments: the emergency relief fund, the reconstruction fund and the desolation relief fund. The emergency relief fund is used for afflicted people emergency rescuing, transferring and accommodation in case of unexpected disaster. Its focus is to provide afflicted people with temporary but urgent boarding, clothing, lodging and medical care, which afflicted people cannot obtain by themselves. The amount of funds to be provided shall conform to specific standard, for instance the number of afflicted people to be transferred and accommodated. The reconstruction fund is meant to ease the living

difficulty of afflicted people during reconstruction period. Its focus is to repair or restore the buildings damaged during the disaster. The amount of funds to be provided shall be determined according to the number of afflicted people and demolished buildings. The desolation relief fund is divided into spring and winter reliefs. Spring sector lasts from March to May, winter sector lasts from December to February the following year. Spring and winter reliefs are used to solve the problem of ration, cloth, quilt and health. The amount of funds to be provided shall depend on the number of afflicted people, the duration of the relief need and the size of the area damaged directly by disaster.

To ensure the implementation of emergency relief work, the MCA and the MOF have established a contingency relief fund system, verifying the time requirement for funds distribution. On the lay of central government, it is stipulated that contingency relief funds must be distributed 2 or 3 days later after the occurrence of a disaster. For example, in 2003, an earthquake took place in Shandan, in the Gansu Province. Contingency relief funds were distributed by the central government after only 6 hours. On the lay of local government, it is stipulated that contingency relief funds must go from province level to county level in 10 days and from county level to afflicted people in 5 days. Spring and winter desolation relief funds distributed by the central government must go from province level to county level in 30 days and from county level to afflicted people in 15 days.

While the central government allocates relief funds, the MCA actively promotes the classified system on diversion of the commitment on relief funds burden among the different level governments in order to mobilize relief funds efficiently. This mechanism has been put in use since 1994 by the MCA and the MOF. Local relief funds allocated increased from 840 million RMB in 1995 to 2.44 billion RMB in 2003. Funds devoted by local authorities of all levels account for one half of the central budget. The establishment of a disaster control system further accentuates the responsibility of authorities of all levels; helps increase the input of relief funds and effectively guarantee afflicted people's basic living.

2.4. System of Relief Supplies Reserve

The MCA and the MOF started to build up a central system for relief supplies reserve. Currently, reserve sites of relief supplies of central level have been set up in more than 10 cities, among which Harbin, Tianjin, Zhengzhou, Wuhan, Changsha, Nanning, Chengdu and Xi'an. Local reserve sites have also been set up in areas that are easily and frequently exposed to natural disasters. A relief supplies reserve network based on relief storage has also been established. Until the end of 2003, the central storage has stored and distributed 271,000 tents. In the year 2003, 130,000 tents were

urgently transported and allocated in 52 batches. It was a record since the establishment of the central relief supplies reserve system in 1998. Those tents were mainly used in the relief operations following the earthquakes of Bachu-Jishi of Xinjiang, Zhangye of Gansu, Dayao of Yunnan, Chifeng of Inner Mogolian as well as the floods alongside Huai River, Wei River and Yellow River. They played an important role in resettling the evacuated people.

Besides, China successively promulgated and implemented more than 30 laws and regulations regarding the reduction of disasters: the Water and Soil Conservation Law, the Earthquake Prevention and Disaster Relief Law, the Flood Prevention Law, the Meteorological Law, etc. Disaster control work has been greatly improved and legalized.

In recent years, scientific and technological applications in the field of disaster control were further enhanced. People understand more and more the formation and development factors, such as meteorology and earthquakes, of major disasters. The technique of disaster monitoring and evaluation has been much further developed. Such advancement provides concrete scientific basis for the government to shape integrated measures for disaster prevention and relief as well as to conduct positive disaster control.

The Chinese government gives great importance to international communication and co-operation in the field of disaster relief. In the recent years, our co-operation with other countries or international institutions in this field has focussed on the following 3 aspects: 1) International aid after the occurrence of a disaster; 2) Bilateral and multilateral co-operation among countries located in disaster-struck areas; 3) Communication and co-operation among corresponding international organizations and non-governmental organizations in the field of disaster control.

3. Challenges in Disaster Control and Relevant Measures

Although great achievements have been made in our disaster control system, there is still inefficiency in current work. We still cannot meet the economic and social development need properly. It mainly appears that:

3.1. Awareness of disaster risk is quite weak.

The obvious contrast between the increasing risk of disasters and the lack of knowledge on disaster prevention & reduction keeps us far away from the real need. In many cases, some casualties should have been avoided. For example: on July 12th 2003, a mud-rock flow broke out in Danba County, in the Sichuan Province, and took away 51 lives. There had

been some signs and warnings before the tragedy but, unfortunately, people got drown in mud, because of their negligent behaviour.

3.2. The administrative system coping with natural disasters is not comprehensive. The capability of emergency response and quick handle of disaster control needs improvement.

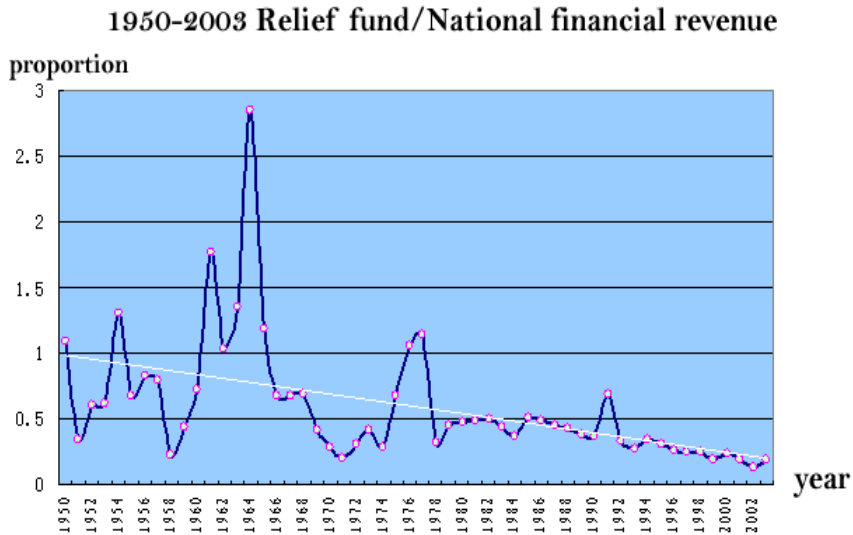
Detailed and practical standards, procedures and regulations in guiding rescue are needed. Due to the lack of appropriate materials, of effective measures after relief works start and of comprehensive response plans, people make plans but without rehearsal, making it very difficult for such plans to be fully executed. Many phenomena also appear unregulated due to the lack of comprehensive laws, regulations and other administrative regulations.

3.3. A gap still exists between the need for relief and actual inputs for disaster control, especially as regards to aid for afflicted people.

On the one hand, after reform and opening up, China's economy has thrived tremendously. The national financial revenue bounced from 6.2 billion RMB in 1950 to more than 2,000 billion RMB in 2003. In the meantime, the input from the central government for disaster relief increased from 60 million RMB in 1950 to 4.05 billion RMB in 2003, which clearly indicates the central government's great attention to disaster relief work.

On the other hand, natural disasters nowadays always take place in those economically underdeveloped areas inhabited by ethnic minority groups. Financial difficulty is very obvious and people's self-relief ability is rather weak in these areas. Moreover, the funds allocated by the government are still insufficient to fully meet the actual relief needs.

Figure 20.3



In order to improve the work in the field of disaster relief and ensure that the afflicted people get effective aid on time, emphasis needs to be put on the following points:

- **Conduct a nationwide education program on people's awareness of disaster reduction.** Emphasis should be put on enhancing consciousness of reducing natural disaster in the whole society, and enhancing the disaster control level of the governmental staff.
- Further enhance the division of tasks between different departments under the unified leadership of the government, and strengthen the mechanism of disaster control. Emphasis should be put on further improving the emergency mechanism, the coordination mechanism, the social mobilizing mechanism, the information sharing mechanism and the supervision mechanism of disaster control, forming concerted efforts of disaster control by bringing the comprehensive coordinating function of disaster resistance and relief into full play and strengthening the communication and coordination of information among the different disaster control departments.
- **Further strengthen and improve the emergency plan system for natural disasters.** We need to speed up the formulation of a department plan for disaster control, efficiently link up the different department plans and establish a plan system for disaster control for China as soon as possible.

- Fully strengthen the development of a disaster information system and bring disaster monitoring, forewarning and forecasting onto a higher level. We should continue to strengthen the information system of disaster control, tighten up the development of an information sharing system of disaster control among different departments. Besides, we need to make full use of modern methods of observation and measurement to forewarn and forecast possible disasters. We need to make sure that after the occurrence of a major natural disaster, reports by local governments in disaster-struck areas on the situation and the efforts of disaster relief can reach the central government within 24 hours as to provide information guarantee for disaster resistance and relief.
- **Further enhance the capability to respond to major natural disasters.** According to relevant regulation of disaster relief, after the occurrence of a major disaster, it is a basic responsibility of the county-level governments in disaster-struck areas to provide basic living aid, especially food and drinking water within 24 hours, to urgently transferred people. This shall be a basic function of authorities at county level in disaster areas.
- **Set up a standard work system to recover and rebuild disaster-struck areas.** Under the unified leadership of government in disaster-struck areas, on the basis of careful planning, scientific guidance and full respect of the wishes of the farmers, we need to efficiently fulfil the task of recovering and rebuilding disaster-struck areas, as well as settling the afflicted people, as to provide assurance for the recovery of a normal production, living and social order.
- **Further clarify the responsibility at each level and guarantee the input of disaster relief.** We need to analyse and clarify in detail the responsibility of government on each level, and carry out in full scale the government responsibility system of disaster control.
- **Perfect the legal system of disaster control as soon as possible.** To perfect the legal system of disaster combat and relief, emphasis should be put on constituting the Law of Disaster Relief as soon as possible to standardize the work of natural disaster relief.

Moreover, it is an urgent task for the government and business society to form jointly an insurance mechanism to cope with disaster relief and recovery processes. Since the 1990s, there have been several pilot studies and trials for insurance tools to use in China. However, this mechanism is still not efficient and has not been widely applied after the occurrence of disasters. It would be beneficial for the victims and government if the experiences and expertise from the international community could be integrated to improve the disaster relief system in China in the future.

Annex 1

List of Speakers and Presentations at the Conference*

Session 1 - Insurability of catastrophic risks

- Economics of catastrophe risk insurance, *Christian Gollier (University of Toulouse)*.
- Insurability of terrorism risk: challenges and perspectives, *Howard Kunreuther and Erwann Michel-Kerjan (Wharton School, University of Pennsylvania)*.
- Industrial, technological and other catastrophes, *Christian Lahnstein (Munich Re)*.
- Recent trends in the catastrophe risk insurance/reinsurance market, *Patrick Murphy O'Connor (Benfield)*.
- Role of the reinsurance industry in the management of weather related risks, *Peter Zimmerli (Swiss Re)*.
- Issues and options in the management of terrorism risk through insurance, *Robert Reville (Rand Corporation)*.
- Current state of the coverage for war and terrorism risks - including NBC - in the aviation sector, *Eugene Hoeven (IATA)*
- Free market solutions for terrorism risks coverage, *Ben Garston (MAP Underwriting and Lloyd's Terrorism Panel)*.

* Power point presentations summarising papers included in this publication as well as other presentations made at the conference are available on the OECD Insurance homepage: <http://www.oecd.org/daf/insurance>.

- Improving insurability and affordability: the role of insurance in hazard identification, risk assessment, risk prevention and mitigation for industrial/chemical accidents, *Satyananda Mishra, IAS, Disaster Management Institute, Bhopal - Government of Madhya Pradesh, India*).

Session 2 - Financial market solutions to manage catastrophic risks

- International financing solutions to catastrophic risk exposures, *Torben Juul Andersen (Copenhagen Business School)*.
- The use of risk linked securities to manage catastrophic risks, including terrorism, *Christian Mumenthaler (Swiss Re)*.
- Current challenges in terrorism risk securitization, *Gordon Woo (RMS)*.
- Financing catastrophic risks in non-OECD countries: challenges and perspectives, *Reinhard Mechler (IIASA)*.
- Current market trends for catastrophe bonds and risk linked securities, *Christopher McGhee (MMC Securities, Guy Carpenter)*.
- The potential for new risk transfer instruments to cover terrorism risks, *Michele David (The Bond Market Association)*.
- Rating agency's perspective on catastrophe bonds and risk linked securities, *Rodrigo Araya (Moody's)*.

Session 3 - Role of governments and development of public-private partnerships for catastrophe risk management

- Role of governments in natural catastrophe risk management and financing in OECD countries, *Paul K. Freeman (University of Denver)*.
- Catastrophe insurance programs in emerging countries: field experience, *Eugene Gurenko (World Bank, Financial Sector Operations and Policy Department)*.
- Potential role for governments in terrorism coverage, *Dwight Jaffee (Haas School of Business, UC Berkeley)*.
- Public-private partnerships to cover terrorism risks in OECD countries, *John Cooke (International Economic Relations Consultant, London)*.

- Role of the US government in the prevention and mitigation of terrorism risks, *Robert Liscouski (Infrastructure Protection Office, Department of Homeland Security, USA)*.
- Disaster risk management policy in Japan, *Kazuhiro Kawachimaru (NIPPONKOA Insurance Company Ltd)*.
- The Spanish experience in the management of extraordinary risks, including terrorism, *Ignacio Machetti (Consorcio de Compensación de Seguros)*.
- A stakeholder approach for developing a public-private partnership: the Hungarian case, *Reinhard Mechler (IIASA)*.
- Disaster risk management policy in China, *Yuanchang Zheng and Jianguo Mu (Department of Disaster and Social Relief, Ministry of Civil Affairs)*.
- The French experience in natural catastrophe risk management, *Suzanne Vallet (Caisse Centrale de Réassurance)*.
- Earthquake risk management policy in Indonesia, *Werner Bugl (PT Asuransi, MAIPARK Indonesia)*.
- Disaster risk management policy in Mexico, *Carlos Bayo Martinez (FONDEN)*.
- Disaster risk management policy in the Philippines, *Ronald I. Flores (Department of National Defense, Office of Civil Defense, National Disasters Coordinating Council)*.
- Disaster management in India, *D. Madan (Under Secretary, National Disaster Management Division, Ministry of Home Affairs, Government of India)*.
- Management of extraordinary risks, including terrorism, in India: achievements and perspectives, *C. S. Rao (Indian Insurance Regulatory and Development Authority)*.

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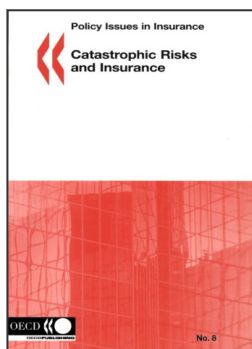
Financial Markets Solutions to Manage Catastrophic Risks

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* Background Note of Mr Kawachimaru's presentation (NIPPONKOA Insurance Company Ltd), based on *Governmental Earthquake Insurance System in Japan*, from *Earthquake Insurance in Japan*, written and published in March 2003 by Non-Life Insurance Rating Organization of Japan.



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