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**IMPLEMENTATION OF THE HYOGO FRAMEWORK FOR ACTION IN  
ASIA AND THE PACIFIC: CASE STUDY: THE NATIONAL DISASTER  
MANAGEMENT SYSTEM OF CHINA AND ITS RESPONSE TO THE  
WENCHUAN EARTHQUAKE**

(Item 4 (b) of the provisional agenda)

*Note by the secretariat*

**SUMMARY**

The present document briefly describes the policy and administrative framework of the national disaster management mechanism of China, illustrated by its response to the catastrophic Wenchuan earthquake in May 2008. The case study is intended to stimulate policy debate by the Committee on Disaster Risk Reduction regarding the development of national disaster management mechanisms, related issues to be addressed and regional cooperation to assist the development and improvement of the emergency response capacities of member countries.

## CONTENTS

	<i>Page</i>
Introduction.....	2
I. THE WENCHUAN EARTHQUAKE AND GOVERNMENT RESPONSE .	3
A. The most serious disaster in the recent history of China.....	3
B. Greatly improved response efficiency due to high-tech tools.....	6
C. Post-earthquake rehabilitation and reconstruction .....	7
II. NATIONAL DISASTER MANAGEMENT SYSTEM OF CHINA .....	8
A. National Master Plan for Responding to Public Emergencies .....	9
B. National thematic disaster response plans.....	10
C. National disaster management mechanisms.....	12
D. Preparation of human resources for disaster response .....	13
E. National disaster financing and material stocking mechanisms.....	14
F. National disaster information management systems .....	14
G. Capacity-building at the rural community level.....	16
III. IMPROVING DISASTER RESPONSE MECHANISMS .....	16
A. Improvement of disaster response plans and preparedness at all levels...	16
B. Enhancing the development of scientific research and technology related to disaster risk reduction.....	17
C. Strengthening disaster management communication preparation.....	17
D. Improving disaster insurance systems .....	18
IV. LESSONS LEARNED .....	18
A. Lessons learned from the preparedness phase.....	18
B. Lessons learned from the response phase.....	18
C. Lessons learned from the recovery phase.....	18
V. CONCLUSIONS .....	19
VI. ISSUES FOR CONSIDERATION BY THE COMMITTEE.....	20

### Introduction

1. China is among the countries that are most seriously affected by natural disasters of many types: floods, droughts and meteorological, seismic, geological, maritime and ecological disasters, as well as forest and grassland fires. Due to its geographical location and meteorological conditions, more than 70 per cent of cities and 50 per cent of the population are located in areas that are often afflicted with major meteorological, geological and maritime disasters.<sup>1</sup>

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<sup>1</sup> China, *National Comprehensive Disaster Reduction Plan for the Eleventh 5-year Plan Period* (State Council, 14 August 2007), accessed from [www.gov.cn/zwgk/2007-08/14/content\\_716626.htm](http://www.gov.cn/zwgk/2007-08/14/content_716626.htm) on 17 November 2008 (Chinese only).

2. Of the world's 10 deadliest natural disasters throughout history, 6 have occurred in China, including the top 3: the 1931 floods, with a death toll of 1 million-4 million; the 1887 Huang He (Yellow) River flood (0.9 million-2.0 million); and the 1556 Shaanxi earthquake (0.83 million).<sup>2</sup>

3. In recent years, improved disaster prevention measures and emergency response capacity have greatly reduced the casualties caused by many types of natural hazards. However, the economic losses caused by them, particularly those occurring in the increasingly developed eastern areas of China, have increased dramatically. For example, the back-to-back blizzards and icy rains that affected 20 southern, central and eastern provinces in January and February 2008 had a relatively low death toll of 1,295 compared with the enormous direct economic losses of 152 billion Chinese yuan (around \$19.4 billion); about 1.66 million people were evacuated and more than 1.9 million travellers were stranded on their way home for the Chinese New Year.<sup>3</sup> During the period 1990-2005, an average of 370 million people were affected by disasters each year and direct annual economic losses amounted to \$25 billion, on average.<sup>4</sup>

4. China has been making disaster management one of its priorities at policy, institutional and operational levels. It has invested in the world's largest flood control project, the dam on the Yangtze River. Meanwhile, work is under way to channel water from the Yangtze River to arid regions prone to drought about 1,000 kilometres to the north. China has been improving its technical systems for monitoring and forecasting disasters, and it has established emergency response plans.

5. The present document provides a brief description of how China responded to the recent Wenchuan earthquake on 12 May 2008 and of its disaster management mechanisms and related policies, institutional arrangements and technical support capacities, which are the result of Government efforts to implement the Hyogo Framework for Action 2005-2015: Building the Resilience of Nations and Communities to Disasters.<sup>5</sup> The response to the Wenchuan earthquake is the largest disaster response action in Chinese history, and assessments of it may be useful to countries in the region for their own disaster management planning.

## **I. THE WENCHUAN EARTHQUAKE AND GOVERNMENT RESPONSE**

### **A. The most serious disaster in the recent history of China**

6. The earthquake on 12 May 2008, the epicentre of which was in Wenchuan County in the south-west of Sichuan Province, ranked as the most devastating disaster in the 59-year history of China. With a magnitude of 8.0 on the Richter scale, the earthquake brought a quake intensity of between VIII and XI to an area of 13,000 square kilometres, in which 29.6 million people live and where most of the casualties occurred. About one third of the 4.56 million people living in the 440,000 square kilometre area impacted by the quake were relocated.<sup>6</sup> By 25 September, the losses

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<sup>2</sup> Jessica Rowe, "Nature's deadliest disasters", *Associated Content*, 2 November 2007, accessed from [www.associatedcontent.com/article/431483/natures\\_deadliest\\_disasters.html?cat=58](http://www.associatedcontent.com/article/431483/natures_deadliest_disasters.html?cat=58) on 17 November 2007.

<sup>3</sup> XU Fuhai, National Disaster Reduction Centre of China, e-mail and telephone communications, September to October 2008.

<sup>4</sup> JIA Zhibang, Vice Minister of Civil Affairs, China, cited in JIANG Yanxin, "Disaster losses average more than 100 billion yuan over the last 15 years", *New Jingbao Daily*, 28 September 2005, accessed from [www.chinaxinjiang.cn/news/gnxw/t20050928\\_59185.htm](http://www.chinaxinjiang.cn/news/gnxw/t20050928_59185.htm) on 17 November 2008 (Chinese only).

<sup>5</sup> A/CONF.206/6 and Corr.1, chap. I, resolution 2.

<sup>6</sup> China, "Announcement on the current situation and the next steps to take in the Wenchuan earthquake response" (State Council, 30 May 2008), accessed from [www.gov.cn/zw/gk/2008-05/30/content\\_999288.htm](http://www.gov.cn/zw/gk/2008-05/30/content_999288.htm) on 17 November 2008 (Chinese only).

had been put at 69,227 deaths, with 17,923 missing and 374,643 hospitalized. In addition, 6.52 million rooms had collapsed in buildings. The city of Beichuan in Beichuan County and the town of Yinxiu in Wenchuan County had been totally razed to the ground. Road, electricity, water supply and communications infrastructures were paralysed over large areas, and 154 major roads and 5 railway lines were broken. Direct economic losses were estimated at a total of \$125 billion.<sup>7</sup>

7. The following factors made the rescue and relief effort one of the most challenging in Chinese history but they are also characteristic of some other major disasters, such as the Kashmir earthquake of 2005:

(a) The most seriously affected areas were mountainous, with deep valleys, and were frequently marked by significant secondary geological disasters, which caused one third of the total earthquake deaths;

(b) The quakes and consequent landslides destroyed, damaged or blocked roads, bridges and waterways, which made the transport of required rescue personnel and equipment to many areas hit by the quake and urgently in need almost impossible;

(c) Telecommunications facilities were disrupted throughout most of the area affected by the quake, particularly in the eight most damaged cities and towns, where telecommunications were totally disabled for at least 30 hours. No information could be sent out of these areas and rescue teams could not be deployed in a timely manner. In areas where satellite mobile handsets became available, the sharp increase in the number of calls jammed the systems;

(d) Unrelated heavy rainfall and dense fog further impeded the deployment of rescue personnel, equipment and vehicles, particularly to areas where airdrop and helicopter were the only means of delivery.

8. By 27 May, more than 8,668 aftershocks had occurred, including 28 above magnitude 5.0 and 5 above magnitude 6.0. Many secondary geological disasters, such as landslides and mudflows, had been triggered and the devastation they caused was intensified by heavy rains.<sup>8</sup> They also led to the formation of 35 high-risk quake lakes that were in danger of collapsing and causing more casualties and damage. In addition, 2,385 reservoirs had been reported to be in dangerous condition. These potential risks posed grave threats to evacuated people and rescue teams, and consumed resources that were used to prevent those situations from becoming disasters themselves.<sup>9</sup>

9. Throughout this challenging and extremely stressful situation, Chinese leaders and institutions quickly pulled together to assess situations and mobilize resources for an effective response. Many senior officials from outside China visited quake sites to better understand the situation, express their sympathies and assess the potential for cooperation. Many of them commended the leadership and efforts that were taking place. The Secretary-General of the United Nations and the Executive Secretary of the Economic and Social Commission for Asia and the Pacific (ESCAP)

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<sup>7</sup> China, "Response to the Wenchuan earthquake as of 25 September 2008", press release (State Council Information Office, 26 September 2008), accessed from [www.41744.cn/gzdt/ldhd/200809/t222722.htm](http://www.41744.cn/gzdt/ldhd/200809/t222722.htm) on 17 November 2008 (Chinese only).

<sup>8</sup> China, "Announcement on the current situation and the next steps to take in the Wenchuan earthquake response" (State Council, 30 May 2008), accessed from [www.gov.cn/zwgk/2008-05/30/content\\_999288.htm](http://www.gov.cn/zwgk/2008-05/30/content_999288.htm) on 17 November 2008 (Chinese only).

<sup>9</sup> YANG Sanjun and YAO Runfeng, "Statistics of Ministry of Water Resources: 2,385 reservoirs damaged by Wenchuan earthquake" (Xinhua News Agency, 28 May 2008), accessed from [www.gov.cn/jrzg/2008-05/28/content\\_995821.htm](http://www.gov.cn/jrzg/2008-05/28/content_995821.htm) on 17 November 2008 (Chinese only).

each visited the site and were impressed by the Chinese leaders, people and organizations.

10. Rapid responses were demonstrated by many people, from the highest Government officials to volunteers from all over the country and the world.

11. Immediately after the quake, China began high-level response actions, as specified in level I of the National Emergency Response Plan for Earthquake Disasters and the National Emergency Response Plan for the Relief of Natural Disasters. Within 2½ hours after the quake, China's Premier boarded an aeroplane to the quake-hit areas in his capacity as Director of the newly established Cabinet Headquarters for Earthquake Response. He quickly established eight working groups, which comprised major Government departments, the military and local governments and were responsible for efforts in: field rescue and mitigation; emergency medical treatment and public health; evacuation, displacement and relief; logistics; infrastructure restoration; the restoration of productive capacity; public security; and public relations.<sup>10</sup> The China Earthquake Administration's first field team of 33 persons and a national earthquake emergency rescue team of 183 persons were dispatched to the disaster area.<sup>11</sup>

12. It is worth noting the key role played by the Chinese armed forces, including the police, when disasters occur. They are organized and prepared and they act quickly. Within a few hours of the Wenchuan earthquake, army rescuers had arrived at the scene, and on the second day, 20,000 more were in place. In one week's time, more than 113,000 soldiers had been deployed; 1,069 flights had taken off; 15 medical treatment, epidemic prevention and psychological intervention teams had been deployed; and 78,000 tons of rescue and mitigation materials had been shipped. The rescuers pulled 21,560 people from the rubble, some still alive. They also treated 34,051 injured persons; relocated 205,370 residents and tourists; and restored 557 kilometres of roads. In the operation, seven soldiers died from the rubble when an aftershock struck.<sup>12</sup>

13. For the first time in history, professional search and rescue teams from abroad joined Chinese rescue efforts, with teams from Japan, the Republic of Korea, the Russian Federation and Singapore coming to the disaster site. Teams from Hong Kong, China and Taiwan Province of China also assisted. In addition, medical assistance teams were sent by the Governments of Cuba, France, Indonesia, Italy, Japan, Pakistan, the Russian Federation, the United Kingdom of Great Britain and Northern Ireland and the United States of America and by the German Red Cross Association.<sup>13</sup>

14. By 4 June, provisional statistics issued by the Ministry of Civil Affairs indicated that the donated cash and goods (including those committed but not delivered) amount to \$5.57 billion. Among those donations, \$5.08 billion in cash and

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<sup>10</sup> LI Bin and LI Dadong, "Premier WEN Jiabao arrived in Sichuan to direct quake responses" (Xinhua News Agency, 12 May 2008), accessed from [http://news.cnwest.com/content/2008-05/13/content\\_1237085.htm](http://news.cnwest.com/content/2008-05/13/content_1237085.htm) on 19 November 2008 (Chinese only).

<sup>11</sup> JIANG Jianke and LIAO Wengen, "Announcement of the China Earthquake Authority on the Wenchuan Earthquake" (People's Net, 12 May 2008), accessed from [www.china.com.cn/news/txt/2008-05/13/content\\_15179853.htm](http://www.china.com.cn/news/txt/2008-05/13/content_15179853.htm) on 19 November 2008 (Chinese only).

<sup>12</sup> China, "China announced its armed forces deployment for disaster response for the first time", *China Review News*, 19 May 2008, accessed from <http://gb.chinareviewnews.com/doc/1006/4/9/4/100649415.html?coluid=7&kindid=0&docid=100649415> on 19 May 2008 (Chinese only).

<sup>13</sup> BAI Ying and FENG Leilei, "Exhibit on international rescue and medical teams responding to the Wenchuan earthquake" (Xinhua News Agency, 5 August 2008), accessed from [www.china-embassy.or.jp/chn/zt/kjzzzcc/t481177.htm](http://www.china-embassy.or.jp/chn/zt/kjzzzcc/t481177.htm) on 17 November 2008 (Chinese only).

\$115 million in goods were donated by the international community. More than 5,000 tons of goods were delivered from overseas.<sup>14</sup>

15. Tens of thousands of ordinary people joined the volunteer teams assisting in the quake-hit areas.

16. As announced by the State Council Information Office on 25 September, government spending on immediate disaster responses topped 80.936 billion yuan (about \$12 billion), with 90.8 per cent of that amount coming from the central Government and the rest from local governments. Domestic and foreign donations reached 59.468 billion yuan in cash and goods. Of the 53,295 kilometres of roads damaged by the quake, 53,020 kilometres were cleared; 128,163 of the 138,960 business outlets damaged by the quake were reopened; 215,851 quake-affected people found new jobs outside of the quake zone; and another 856,560 people resumed work in their hometowns.<sup>15</sup>

### **B. Greatly improved response efficiency due to high-tech tools**

17. Effectiveness in disaster response relies greatly on the management of relevant information. During the response period, many high-tech tools were used for field actions or deployed to quake-hit areas, mostly for disaster information management.

18. Within two hours of the quake, a map indicating basic information about the epicentre and major affected areas had been prepared by the National Disaster Reduction Centre and submitted to the highest level of decision makers. The map integrated information on earthquake intensity levels and demographic, transport and other background information, as well as satellite images.

19. In the following days, 120 maps and reports derived from satellite and aeroplane images were submitted by the Centre and its cooperative partners. They provided critical information on the severity of the catastrophe, including updates on collapsed buildings, quake-lakes and roadblocks and the identification of relocation sites. During this response period, more than 1,300 images from 23 satellites, including foreign satellites, were provided by space agencies, most of them free of charge. Manned aeroplanes and unmanned micro aeroplanes equipped with remote sensors flew over the areas hit by the quake to collect field information with a view to more effectively deploying rescue and mitigation forces and relocating affected people.<sup>16</sup>

20. Emergency response relies heavily on telecommunications. Urgent needs for telecommunications were first met by satellite-based means, as 25,000 persons were mobilized to restore telecommunications facilities that had been seriously damaged. A total of 383 emergency telecommunications vehicles were dispatched, many of them equipped with satellite communications facilities, but due to road damage, they could not reach some of the most seriously hit areas. More than 2,000 satellite mobile handsets were deployed. The first call from the epicentre was made by a satellite mobile phone 30 hours after the quake. By 16 May, cellular mobile services in some of the most seriously hit areas had been restored via satellite. Broadband links were established by more than 1,300 satellite terminals, some of which had to be carried by

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<sup>14</sup> China, "MCA/MFA/MOB briefing on the acceptance of international donations", press conference (Xinhua News Agency, 4 June 2008), accessed from [http://news.xinhuanet.com/politics/2008-06/04/content\\_8312408.htm](http://news.xinhuanet.com/politics/2008-06/04/content_8312408.htm) on 4 June 2008 (Chinese only).

<sup>15</sup> China, "Announcement: status of responses to the Wenchuan earthquake", (State Council Information Office, 26 September 2008), accessed from [www.41744.cn/gzdt/ldhd/200809/t222722.htm](http://www.41744.cn/gzdt/ldhd/200809/t222722.htm) on 17 November 2008 (Chinese only).

<sup>16</sup> XU Fuhai, National Disaster Reduction Centre of China, e-mail and telephone communications, September to October 2008.

pure manpower. They were used for networking, transmitting remote sensing images, holding videoconferences among decision makers and using telemedicine among field teams and major supporting hospitals.<sup>17, 18</sup>

21. Many thematic maps dedicated to emergency response were produced by survey and mapping authorities. While more than 53,000 hard copies were disseminated among field workers, electronic maps were also produced for decision makers, including the three-dimensional digital model of the Tangjiashan quake-lake, which presented the greatest risk. The electronic maps contributed to a major mitigation effort during the response period, which eliminated the risk.<sup>19</sup>

22. Beidou satellite positioning handsets, which were provided to most rescue teams, also provided the use of short message services (SMS), which were extremely important for the timely deployment of rescue teams when other means of communication were not available. Three kinds of life detectors were provided to rescue teams to search under rubble for the timely rescue of those who had been buried.

23. Within the National Research and Development Programme, funds were urgently allocated to enhance response-related technical support activities in the following priority areas: a comprehensive assessment of the formation mechanism of the Wenchuan earthquake and the damage and loss it caused; the monitoring and prevention of secondary disasters; and other research and development projects supporting the rehabilitation and reconstruction effort.

### **C. Post-earthquake rehabilitation and reconstruction**

24. The Regulations on Post-Wenchuan Earthquake Rehabilitation and Reconstruction were promulgated on 8 June 2008 by the State Council<sup>20</sup> to ensure an effective and orderly post-earthquake rehabilitation and reconstruction and a stable resumption of normal life and economic activities. The regulations emphasized that the following guidelines should be followed throughout the rehabilitation and reconstruction period:

- People-oriented actions to ensure a safer environment;
- Scientifically sound and comprehensive planning;
- Phase-by-phase implementation;
- A joint funding mechanism combining self-reliance, government subsidies and social donation assistance.

25. Under the regulations, a survey would be conducted to assess the damage and the resource needs for rehabilitation and reconstruction.

26. The central Government, in addition to the assistance it provided to the quake-hit areas for rehabilitation and reconstruction, also promoted the establishment

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<sup>17</sup> China, "Telecom operators sent 25,000 people to restore services in quake-hit areas", *Nanfang Dushi Daily*, 20 May 2008, accessed from <http://tech.163.com/08/0520/15/4CD9FNKF000915BE.html> on 17 November 2008 (Chinese only).

<sup>18</sup> China, "Briefing on the telecom support situation for earthquake responses" Ministry of Industry and Information (Xinhua News Agency, 30 May 2008), accessed from [http://news.xinhuanet.com/politics/2008-05/30/content\\_8281788.htm](http://news.xinhuanet.com/politics/2008-05/30/content_8281788.htm) on 30 May 2008, (Chinese only).

<sup>19</sup> China, "Survey and Mapping Department provided 53,000 maps supporting disaster response" (Bureau for Survey and Mapping, 17 June 2008), accessed from [www.gov.cn/gzdt/2008-06/17/content\\_1019098.htm](http://www.gov.cn/gzdt/2008-06/17/content_1019098.htm) on 17 November 2008 (Chinese only).

<sup>20</sup> China, *Regulations on Post-Wenchuan Earthquake Rehabilitation and Reconstruction* (State Council, 9 June 2008), accessed from [www.gov.cn/zwgk/2008-06/09/content\\_1010710.htm](http://www.gov.cn/zwgk/2008-06/09/content_1010710.htm) on 17 November 2008 (Chinese only).

of a paired assistance mechanism via which 19 provincial level administrations were assigned to establish one-to-one paired relations with a specific one of the 19 most seriously affected counties. The modalities of the paired assistance included the following:<sup>21</sup>

- (a) Providing services such as reconstruction planning, building design and expert advisory, construction and supervision services;
- (b) Building and repairing residential buildings and public service facilities such as schools, hospitals, broadcasting and television facilities, and cultural, sports and welfare facilities;
- (c) Building and repairing infrastructures for services such as roads, water and gas supply, drainage, sewage and garbage disposal;
- (d) Building and repairing the agricultural infrastructure and providing agricultural technical services;
- (e) Providing machinery, tools, equipment, building materials and other support goods;
- (f) Providing teachers and medical personnel, organizing training and assisting in the provision of human resources and in job placement;
- (g) Encouraging investments in industrial and commercial service facilities and in commercial infrastructure development.

27. By 5 October, the resources committed for the mechanisms had reached 22.7 billion yuan for the subsequent three years.<sup>22</sup>

## II. NATIONAL DISASTER MANAGEMENT SYSTEM OF CHINA

28. The response to the Wenchuan earthquake was the result of the Government's disaster management process (called the disaster emergency response in official documents), a comprehensive system involving various central and local government sectors.

29. The process covers the following disaster risk reduction phases:

- (a) Disaster preparedness, including risk assessment, institutional and technical arrangements for emergency response, mitigation, monitoring and early warning;
- (b) Field responses for rescue, mitigation and relief actions, which require the active participation of the whole society and the mobilization of both civilian and military resources;
- (c) Disaster rehabilitation and reconstruction.

30. A complete, reasonable and effective disaster response system should outline, in advance, plans and arrangements for actions prior to, during and after major disasters and should take into consideration all relevant factors that may

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<sup>21</sup> China, "State Council promulgates the paired assistance plan for rehabilitation and reconstruction after the Wenchuan earthquake" (State Council, 18 June 2008), accessed from [http://news.xinhuanet.com/politics/2008-06/18/content\\_8391394.htm](http://news.xinhuanet.com/politics/2008-06/18/content_8391394.htm) on 17 November 2008 (Chinese only).

<sup>22</sup> (LIU Zheng), "27.7 billion yuan committed for paired assistance for reconstruction after the Wenchuan earthquake" (Xinhua News Agency, 5 October 2005), accessed from <http://news.qq.com/a/20081005/000790.htm> on 17 November 2008 (Chinese only).



influence the response process. Such a plan should focus on early detection, early reporting, early control and early response, and it must be scientifically sound and technically actionable. Under the emergency response plan, components such as risk assessment, material and equipment preparation, institutional operation and response drills must be routinely conducted to ensure a smooth transition from a normal situation to an emergency situation and to support effective and efficient responses to prevent further deterioration following disasters.

31. China has enacted more than 30 laws and regulations related to disaster management, including the Law on Earthquake Preparedness and Disaster Reduction. The national legislature adopted the Emergency Response Law on 30 August 2007 as the overall legal document governing all emergency responses in China, including disaster response.

32. Under the related law and regulations, the Government has established an emergency response system comprising the following three levels:

- (a) The National Master Plan for Responding to Public Emergencies;
- (b) Five national thematic disaster response plans;
- (c) Emergency response plans for 15 central Government departments and their detailed implementation plans and operation norms.

#### **A. National Master Plan for Responding to Public Emergencies**

33. On 8 January 2006, the State Council issued the National Master Plan for Responding to Public Emergencies,<sup>23</sup> an overall framework to be used at all levels of government to ensure public security and cope with public emergency events, including all disaster response activities. This National Master Plan is applicable to public emergencies that extend across provincial boundaries and to those with impacts requiring responses that are beyond the capacity of provincial governments.

34. The National Master Plan identifies four kinds of public emergencies: natural disasters, accidents, public health events and social security events. According to the nature of the events, their severity and controllability, and the areas affected by them, these events are classified into four response categories under the Plan: (a) level I for the *most severe* situation, where the response is organized directly by the central Government, together with the affected provincial and local governments; (b) level II for *very severe* events, where the relevant provincial governments are primarily responsible for organizing responses, with the assistance of the central Government; (c) level III for *severe* events; and (d) level IV for *general* public emergencies, where events could be dealt with mainly by local governments, with the assistance of relevant central Government departments.

35. The National Master Plan emphasizes the importance of: (a) cooperation and coordination among different levels of government and central Government departments; and (b) the general mobilization of social resources, involving both civilian and armed forces. It also sets out six principles for dealing with public emergencies:

- (a) Prevention first;
- (b) A people-oriented approach to reduce casualties;

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<sup>23</sup> China, *National Master Plan for Responding to Public Emergencies* (State Council, 7 August 2005), accessed from [www.gov.cn/yjgl/2005-08/07/content\\_21048.htm](http://www.gov.cn/yjgl/2005-08/07/content_21048.htm) on 17 November 2005 (Chinese only).

(c) Centralized planning and organization mechanisms, with the responsibility of government organs at all levels clearly defined: while local governments bear the primary responsibility for responding to the public emergencies that occur within their administrative areas, the relevant higher level governments and central Government departments should provide all necessary assistance to and coordination of the responses;

(d) Standardized operating procedures for government organs at different levels, within the relevant legal framework;

(e) Capacity-building for a coordinated rapid response by all relevant parties;

(f) Enhanced scientific and technical support to ensure the efficiency and effectiveness of the response system.

## **B. National thematic disaster response plans**

36. To ensure a coordinated and standardized emergency response, the State Council also formulated five thematic plans under the National Master Plan for the detailed assignment of duties and arrangements for major disaster response categories.<sup>24</sup> These thematic plans emphasize the role of responsible central Government departments in dealing with major disasters, where local governments may lack the relevant capacity to handle them properly. One of the plans, the disaster relief plan, deals with relief-related actions to support the implementation of the other thematic national emergency response plans.

### **1. National Emergency Response Plan for Natural Disaster Relief**

37. This plan is applicable to relief actions for all kinds of natural disasters and public emergency events in China that reach the activation threshold. Implementation of the plan is coordinated by the National Committee for Disaster Reduction, with its office hosted by the Ministry of Civil Affairs.

38. During the implementation, the Ministry of Civil Affairs will coordinate with the National Development and Reform Commission, the Ministry of Finance and other relevant departments to arrange the central Government's disaster relief fund and to facilitate the financial inputs of local governments for relevant relief actions, in accordance with the principle that all local governments of affected areas have the responsibility to organize disaster relief actions and to bear the primary financial burden, within their capacity.

39. The Ministry of Civil Affairs is also responsible for the comprehensive planning, establishment and management of stocks of disaster relief materials and their shipment and distribution to the affected people.

40. Under the plan, the Ministry has been promoting a nationwide six-level emergency response system to cover national, provincial, prefectural, county, township and community levels, with local emergency response plans at township and community levels as its focus in recent years.

### **2. National Emergency Response Plan for Flood and Drought Disasters**

41. The Office of State Flood Control and Drought Relief headquarters, with its office hosted by the Ministry of Water Resources, is responsible for the formulation

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<sup>24</sup> China, "State Council promulgates national thematic disaster response plans" (Xinhua News Agency, 11 January 2006), accessed from [www.gov.cn/jrzg/2006-01/11/content\\_153799.htm](http://www.gov.cn/jrzg/2006-01/11/content_153799.htm) on 17 November 2008 (Chinese only).

of policies, norms and regulations on flood and drought disaster mitigation and response. It has drawn up flood disaster prevention plans for major river basins and water transfer plans across provinces for mitigating drought disasters and has been coordinating flood and drought disaster mitigation plans at various levels.

42. When a flood or drought disaster occurs, the emergency response plan will be activated at the appropriate level when corresponding criteria are reached. A field headquarters headed by the highest administration appropriate to the level of the disaster should be established to mobilize necessary resources and technical support, to take emergency response actions and to report relevant developments to the administrative body immediately above it.

43. The response plan's prevention and early warning mechanism comprises information systems, prevention and preparation actions, early warning systems and early warning support systems.

### **3. National Emergency Response Plan for Earthquake Disasters**

44. While provincial governments are the main bodies dealing with very severe and most severe earthquake disasters, the national emergency response plan should be implemented by the China Earthquake Administration for very severe earthquakes and by the State Council for the most severe earthquake events, in order to provide coordination, resource mobilization and technical support.

45. When an earthquake in the most severe category takes place, a level I emergency response would be activated, and a State Council headquarters for earthquake mitigation and relief would be established, with its office hosted by the China Earthquake Administration, to assist the provincial governments with the overall organization and coordination of emergency response actions. The armed forces should also be asked to respond.

46. The national earthquake monitoring and detection network, which is composed of more than 1,200 observation stations under national, provincial and local earthquake authorities, detects earthquake indicators and measures the magnitude and intensity of earthquakes, then transmits, processes, analyses, archives and reports information on earthquakes and volcanoes. The Network Centre is responsible for archiving reported information and for running routine processes and analyses to trace information relevant to earthquake activities.

47. For identified high-risk areas, the detection should be intensified in the short term and, if a possible earthquake is anticipated, it should be reported to the relevant governments so that they can adequately prepare, take mitigation actions and make decisions on whether an early warning for evacuation should be issued, although current human knowledge on earthquakes has not provided reliable technical tools for such predictions.

48. Within one hour after an earthquake, the China Earthquake Administration and local earthquake authorities should announce the time, epicentre and magnitude of the earthquake and provide an intensity map to the relevant authorities; within 24 hours, a preliminary impact assessment and an aftershock trend analysis should be announced.

49. In the quake-hit area, an emergency coordination mechanism led by the local government and coordinated by earthquake authorities should be established in the following areas:

- (a) Collecting impact information, making a preliminary assessment and reporting to the relevant authorities and the public;
- (b) Coordinating and assigning areas for search and rescue actions among all kinds of teams, including those from the armed forces and from abroad;
- (c) Identifying risks and threats of secondary disasters (such as fires, floods, environmental pollution and outbreaks of epidemics) and coordinating with the relevant authorities to take measures to eliminate or reduce these risks;
- (d) Organizing evacuation and relocation efforts;
- (e) Organizing and coordinating the restoration of lifeline facilities for communication, transport and supplies of water, electricity and fuel;
- (f) Coordinating and organizing communication support for earthquake responses: satellite mobile and very small aperture terminals (VSAT) should be equipped for field actions and emergency communication vehicles should be deployed to the disaster-hit areas for both action support and the restoration of local communication networks;
- (g) Estimating relief needs and making relevant arrangements;
- (h) Receiving and distributing relief materials;
- (i) Assessing the safety of the buildings in affected areas.

#### **4. National Emergency Response Plan for Geological Disasters**

50. This plan deals with disasters triggered by geological factors, such as a mountain collapse, landslide, mudflow or ground subsidence.

51. With arrangements similar to those of the National Emergency Response Plan for Earthquake Disasters, the land resources administration body under the State Council bears the responsibility for the organization, coordination, guidance and supervision of activities designed to prevent and respond to geological disasters. When a severe geological disaster occurs beyond the handling capacity of local government, the State Council would establish a temporary headquarters to organize effective disaster mitigation, rescue and relief actions.

#### **5. National Emergency Response Plan for Very Severe and Most Severe Forest Fire Disasters**

52. This plan addresses large-scale forest fire disasters with arrangements similar to those of the above-mentioned thematic emergency response plans. The State Forestry Administration is the responsible central Government department.

#### **C. National disaster management mechanisms**

53. The National Master Plan considers the following six major components of disaster management:

- (a) Disaster prevention;
- (b) Early warning and alert dissemination;
- (c) Reporting to relevant government organs to activate emergency response plans;

- (d) Issuance and dissemination of information to the public;
- (e) Emergency response, including mitigation, rescue and relief;
- (f) Rehabilitation and reconstruction, including the mobilization of social donations.

54. Based on the experience accumulated through years of practice in disaster management, China has formed the current natural disaster management mechanism: the State Council provides overall leadership and guidance; local governments are responsible for leading all response actions; and the responsibilities of relevant government organs are clearly assigned, as indicated in the national emergency response plans. It should be emphasized that all disaster management authorities at the level of local government must fulfil their assigned responsibilities and the armed forces should serve as the backbone of field response actions.

55. China has established comprehensive coordination mechanisms for disaster prevention, mitigation and relief for all levels of government, from central to local. During severe disasters, at the central Government level, the National Committee for Disaster Reduction, the Office of State Flood Control and Drought Relief headquarters, the State Council Headquarters for Earthquake Mitigation and Relief, and the State Headquarters for Forest Fire Control are coordinated by the National Coordination Office for Disaster Mitigation and Relief. Provincial and municipal governments have established their own comprehensive coordination mechanisms to cope with major public emergency events, and all local governments have established specific offices at the county level to deal with disaster emergencies.

56. The National Committee for Disaster Reduction is responsible for formulating national disaster reduction policies, strategies and programmes; coordinating with central Government departments; and providing guidance to local governments for disaster mitigation and relief activities. The Committee comprises 34 ministries and administrations under the State Council, with its chairs at the level of vice-premier. The Committee is also supported by an 18-member expert group, which provides advisory services to assist in decision-making.

57. When a large-scale disaster occurs, the relevant provincial government or responsible central Government department should report the disaster to the central Government, activate the relevant national emergency response plan and organize timely and effective field actions within its terms of reference. To ensure a successful response, close coordination among relevant government bodies and departments and the participation of both the armed forces and civilian societies are encouraged.

58. The Constitution and relevant laws have assigned the armed forces to act as the backbone of field actions during disaster responses. The Office for Public Emergencies is the joint headquarters of the military and the armed police for dealing with disaster emergencies and coordinating with central and local governments.

#### **D. Preparation of human resources for disaster response**

59. Chinese efforts to build human resources to respond to major disasters are focused on the establishment and operation of a three-tiered manpower mobilization mechanism: professional sectors and their professional teams are the core; volunteers and civil societies are complementary; and community-based capacity acts as the base for emergency response actions.

60. Disaster management authorities have preliminarily shaped the mechanism, which has: (a) a backbone of military, police and armed police; (b) core professional

teams dealing with flood and drought; maritime search and rescue; forest firefighting; mine, railway and nuclear accidents; and human and animal epidemics; and (c) supplementary forces composed of staff from relevant enterprises and organizations and volunteers. Work at the rural community level has been emphasized in recent years.

#### **E. National disaster financing and material stocking mechanisms**

61. In 1994, the Ministry of Civil Affairs and the Ministry of Finance established a mechanism for central and local governments to share the management and financial responsibilities of disaster response and relief by establishing special financial budgets for the response to and relief of general disasters. For the most severe natural disasters, such as the Wenchuan earthquake, which need huge financial resources for relief and post-disaster rehabilitation and reconstruction, the State Council may approve the establishment of special disaster relief and reconstruction funds.

62. To complement these increased financial inputs to disaster reduction, several central and local government departments—including civil affairs, water resources, agriculture and forestry—have established a system for stocking disaster relief materials that has ensured rapid relief action during major disasters and the timely restoration of normal life activities and production. The system comprises 10 central Government stocks and local stocks in areas where disasters happen frequently.

#### **F. National disaster information management systems**

63. China has established preliminary disaster monitoring and early warning systems for meteorological, oceanic, hydrological, geological, earthquake and forest fire disasters, and for agronomic and forest pests and diseases. Their coverage and timeliness are continually being improved.

64. Geographic Information System (GIS) technology has been widely used by disaster management authorities at all levels and in all sectors to integrate background geographic, economic and social information; risk zonation and historic disaster information; and local knowledge and to build upon disaster management decision support tools, which may incorporate dynamic ground and satellite monitoring information for monitoring and early warning of disasters; mitigation planning; supporting field mitigation, rescue and relief actions; and resettlement and recovery planning.

65. Many municipal governments have established integrated urban emergency response systems that are supported by information networks in the relevant sectors and government organs. Comprehensive disaster response is one of their main functions.

66. The Ministry of Civil Affairs has established a natural disaster information management system. It is linked to disaster management information systems at the provincial, municipal and county levels and to those of the relevant central Government departments, and it has telephone and fax contacts to all levels of government, including the township level. The 24-hour operating system functions as a disaster information reporting channel and sharing platform, through which information on severe disasters can be reported, even from a township, to the system manager to ensure the timely collection of information on severe disasters and reporting to the relevant authorities, including the State Council, which can activate the corresponding disaster response plans.

67. The national meteorological authorities have established a comparatively advanced meteorological monitoring, prediction and forecasting system, which is supported by meteorological satellites, radar and numerical models. China has also established meteorological disaster early warning dissemination systems to alert the public about forthcoming disastrous weather events and recommend appropriate actions to be taken.

68. The land resources management authorities have established information systems for surveying and monitoring locations prone to geological disasters. The hydrological authorities have established a national hydrological monitoring network for disastrous flood monitoring, prediction and early warning. The forestry management authorities have established an operational mechanism for forest fire prediction and monitoring, a monitoring network for forest pest and disease disasters, and a sandstorm monitoring system. The earthquake authorities have established an earthquake observation network and an institutionalized operational system for earthquake detection, monitoring, reporting and prevention, and they have formulated issuance procedures for warnings based on earthquake predictions. Finally, the oceanic authorities have established an oceanic environment forecasting system.

69. In recent years, satellite remote sensing technology, satellite navigation and positioning technology and unmanned remote sensing aeroplane technology have been widely used in disaster management and have provided decision makers with indispensable informational support. China has launched meteorological, oceanic and land resources satellite systems for disaster management. To fill in the gaps in effective coverage, timeliness and all-weather observation left by these satellite systems, China is developing a dedicated satellite constellation for environment and disaster monitoring. The fully deployed constellation, comprising four optical and four radar satellites, will have a revisit interval of less than 12 hours, which will improve information-gathering capabilities in disaster-affected areas, including those with cloud cover. The first two optical satellites were launched in September 2008, and the first radar satellite will be launched in early 2009. Considering that the constellation may serve all countries in the world, the Government of China proposed that the full deployment and long-term services of the constellation could be realized through international cooperation. China has also participated in some international initiatives on providing satellite information during disasters, as both a contributor and a beneficiary.

70. As a long-term strategy to cope with natural disasters, the National Committee for Disaster Reduction organizes annual disaster information analysis meetings attended by relevant experts and Government departments to analyse the trends of major disasters. It also organizes monthly consultations with relevant government departments to analyse the characteristics of major disasters that may happen in the next two months. The results of these analyses are circulated to relevant government departments for the timely preparation and establishment of response plans.

71. The Government of China has been implementing scientific research and technical development projects in many disaster management fields, such as disaster formation mechanisms; disaster detection, monitoring and forecasting; disaster prevention and reduction; and comprehensive countermeasures for disaster reduction. These projects have deepened the understanding of the formation and development of many disasters. The development and application of disaster reduction technologies have enhanced the capacity of China in the following areas: disaster monitoring and forecasting; protection against earthquake, fire and wind disasters; the construction and repair of flood control facilities; integrated rehabilitation from desertification; integrated crop and forest pest and disease management; the prevention of geological disasters; and rapid disaster impact assessment.

### **G. Capacity-building at the rural community level**

72. Disaster response capacity-building at the rural township and community levels has been the focus of recent efforts to improve the national six-level disaster response system in China. Based on disaster response plans, capacity-building at the community level is focused on following components:

(a) A rural community disaster management mechanism that deals with matters related to pre-disaster prevention, disaster response and post-disaster restoration at the community level. Such a mechanism includes the functions of: assigning disaster management responsibility to community members, monitoring and disseminating early warning alerts, reporting disaster-related information to higher administrative bodies and educating and training the people;

(b) The formulation of disaster response plans at the village level, particularly thematic plans for disaster-prone villages;

(c) The organization of drills for the implementation of the emergency response plans;

(d) The establishment of volunteer teams at the village level;

(e) The establishment of stocks of disaster response materials at both the village and family levels;

(f) The possible use of disaster insurance to share the burden of disaster risks and damage.

### **III. IMPROVING DISASTER RESPONSE MECHANISMS**

73. The Wenchuan earthquake was yet another reminder that mankind must live with natural hazards. Though the formation mechanisms of many natural disasters are not well understood and they are, therefore, hard to prevent, measures can be taken to reduce their direct and consequent impacts.

74. The Government of China has decided to further strengthen national disaster risk reduction efforts and to enhance its institutional and technical preparations for disaster response mechanisms. Focused on the lessons learned from the responses to the Wenchuan earthquake, measures have been taken to improve disaster response mechanisms at all levels and in all sectors in China.

#### **A. Improvement of disaster response plans and preparedness at all levels**

75. The Ministry of Civil Affairs is taking the following actions to improve the disaster planning and response capacity of China:

(a) Formulating a national emergency response plan for large-scale disasters and developing a series of templates to perfect disaster response plans at all levels, particularly at the county, township and community levels;

(b) Enhancing coordination through the establishment of joint disaster response mechanisms among the government departments responsible for disaster field response actions;

(c) Improving financing mechanisms for disaster response at all levels of government;



(d) Enhancing the inventory management system for disaster response materials;

(e) Establishing a disaster information management system at the community level to improve capacities in disaster information assessment, reporting and management;

(f) Establishing and improving disaster donation mechanisms, disaster response volunteer systems and emergency expropriation and compensation mechanisms to enhance social mobilization capacities during major disasters.

### **B. Enhancing the development of scientific research and technology related to disaster risk reduction**

76. The effectiveness of disaster management depends greatly on the effective acquisition and utilization of disaster-related knowledge and information.

77. Detecting and predicting earthquakes remains a scientific challenge worldwide. The national earthquake monitoring and detection network needs to be further enhanced through the development and strengthening of international and regional earthquake information-sharing networks and the expansion of observation networks to fill gaps in coverage. China decided to promote a national earthquake safety programme to improve its national capacity in all fields related to reducing the risk of earthquake disasters and to promote international cooperation in the detection and study of the precise structure of the lithosphere and mantle of the Earth and the fault activities of plate tectonics. China has expressed interest in the cooperative establishment of observation stations in interested countries in the Asia-Pacific region. It plans to develop experimental satellite(s) for international cooperative research to detect variations in the Earth's electromagnetic field and their correlation with plate tectonic movements, which are the main cause of severe tectonic earthquakes.

78. China plans to facilitate the full deployment of an eight-satellite environment and disaster monitoring constellation and it has expressed its intention to develop international and regional cooperation for the long-term operation and services of the constellation around the world, particularly in the Asia-Pacific region.

79. During the response period following a disaster, detailed field information about some key areas is crucial to relevant decision-making. Ordinary aeroplanes may not be suitable for such surveillance tasks due to terrain and weather limitations. As unmanned aeroplanes equipped with remote sensors have demonstrated advantages in performing such work, efforts have been made to make such aeroplanes cheaper, lighter and easier to deploy and operate in disaster response field environments, and relevant image processing techniques are under development to transfer the pictures into normal map products.

### **C. Strengthening disaster management communication preparation**

80. The Wenchuan earthquake severely damaged telecommunications facilities; ground-based telecommunications facilities were severely damaged and satellite-based facilities were first used to ensure the urgent needs of field teams and to temporarily restore cellular mobile services. However, the increased phone traffic exceeded the handling capacity of the satellite systems and caused jamming, and road and weather conditions further delayed the deployment of satellite terminals to those areas most in need. The lessons learned have led the telecommunications authorities of China to consider more reliable technical plans for effective disaster management communications that can be rapidly deployed.

#### **D. Improving disaster insurance systems**

81. Along with the apparently more frequent occurrence of certain natural disasters and the increasing economic losses caused by them, the current system in which insurance payments for disaster loss claims cover only a small percentage of total disaster compensation, with governments bearing the greatest responsibility, should be replaced by a more reasonable disaster compensation sharing mechanism. The Government of China has realized the importance of a properly established and operated disaster insurance system, and it is considering approaches to establish such a system, which could be a vital tool for managing economic compensation and a major force for the implementation of disaster prevention and preparedness at the local and community levels.

### **IV. LESSONS LEARNED**

82. China has been making great efforts in disaster risk reduction—a priority area of its national economic and social development programme—through the formulation of disaster response plans from the national through the community level, and it has established relevant institutional arrangements, technical support and financial mobilization mechanisms. Such preparedness proved to be effective and efficient in response to many major disasters in recent years, particularly the Wenchuan earthquake. The increased capacity greatly reduced losses of both human lives and property, and it contributed to the country's stable long-term social and economic growth.

83. Nevertheless, just as China learned from previous disasters, such as the severe acute respiratory syndrome (SARS) epidemic in 2003, and benefited from it during the emergency response in Wenchuan, the earthquake can provide some lessons for improving disaster management in China and in other countries in Asia and the Pacific.

#### **A. Lessons learned from the preparedness phase**

84. Wenchuan was not considered a high-risk seismic zone; therefore, the population was not focused on preparing for such an earthquake. Although seismic building codes were in place, older buildings had not been retrofitted and the overall enforcement of the codes might not have been optimum. Experts have judged that most of the significant damage to buildings could have been prevented through better observance of seismic codes for newly built buildings, the identification of dangerous buildings and the protection of key facilities against seismic shocks.

#### **B. Lessons learned from the response phase**

85. The Wenchuan earthquake saw foreign rescue teams joining domestic rescue efforts for the first time in Chinese history, but they missed the “golden” window of the first few days, arriving on the scene four days after the quake. This indicates that countries need to make regional or subregional arrangements on the acceptance of international humanitarian assistance, and particularly on procedures for the entry of specialized foreign rescue teams, before any major disasters occur.

#### **C. Lessons learned from the recovery phase**

86. If buildings such as schools or hospitals are to be occupied immediately after a disaster for shelter or emergency operations, they should be designed and constructed to a higher standard than normal buildings.

87. In many towns, buildings that did not collapse were not immediately inspected. Establishing a building inspection procedure (e.g. using a standardized rapid inspection technique to assess the structure and recommend repairs) and a safe entry tagging system for buildings can facilitate reoccupation. California and Japan have trained volunteer engineers to inspect and tag buildings for safety (i.e. no entry, limited entry or safe entry) after an earthquake.

88. This was the first time that tens of thousands of volunteers joined the field response efforts following a disaster. While such ardour should be encouraged, it was noted that many volunteers lacked the necessary disaster response knowledge. The formal and informal education of volunteers in dealing with disaster response matters should be a major preparedness effort to enhance the resilience of the communities.

## V. CONCLUSIONS

89. To facilitate national economic and social development, efforts in disaster management should be considered a priority: legislative documents should be formulated; disaster response plans should be prepared at all levels, from national to community; and relevant institutional and technical preparation and financial mobilization mechanisms should be established. Such preparedness efforts proved to be effective and efficient when China responded to the Wenchuan earthquake. Similar capacities should be established in all countries in the region in order to reduce losses of both human lives and property and to contribute to stable long-term social and economic growth.

90. Disaster management and emergency response planning is the responsibility of governments at all levels, beginning with the national Government. While policy is formulated and relevant institutional arrangements and technical capacities are established at the national level, local governments are more able to carry out certain prescribed actions and to mobilize community resources to support the response effort. These response plans may serve as a basis for the international community in designing more efficient supportive processes for future disasters.

91. Armed forces and/or other disciplined services, including the police, are important core forces for emergency response. The mobilization and deployment of armed forces for emergency response should be a critical component of response plans at the national and provincial levels. Organization and coordination mechanisms among the armed forces and relevant government bodies should be kept operational, as mandated for civil defence tasks.

92. Many technical support systems are based on information and communications technologies, and they may tremendously improve the effectiveness and efficiency of disaster prevention, preparation and emergency response actions. They should be built as integral parts of national emergency response plans. However, for many small economies in the Asia-Pacific region, building and operating such systems individually is not reasonable and is sometimes impossible, both financially and technically. Building such a technical support capacity or sharing existing capacities regionally or subregionally may greatly improve their cost efficiency and reduce the burden borne by individual countries. In this regard, ESCAP may assist its members and associate members in developing such cooperative mechanisms for the development of and access to these technical support systems.

93. The paired assistance approach may be considered a very special arrangement in China in its response to the aftermath of the Wenchuan earthquake. However, its

principle of mutual assistance among governments at the provincial level could be considered a useful approach for mobilizing the resources needed for post-disaster actions in many countries in the region.

94. Closer cooperation among ESCAP members and associate members in experience-sharing and capacity-building for the development of comprehensive national emergency response plans, the integration of disaster risk reduction into national development planning and the sharing of technical support capacities should be developed or enhanced.

#### **VI. ISSUES FOR CONSIDERATION BY THE COMMITTEE**

95. The Committee may wish to review the issues presented in the present document and advise the secretariat on priority areas of work to support regional cooperation in the following areas:

(a) Promoting regional cooperation in the formulation of national policies, strategies and programmes on disaster management and response planning;

(b) Promoting regional cooperation in the development of collaborative technical and information capacities for disaster management, as an integral part of national disaster response plans.

96. The Committee may wish to provide the secretariat with guidance on issues of common concern to members and associate members and to deliberate on the secretariat's proposed strategy for disaster risk reduction, including possible work programme outputs that could be reflected in the programme of work for 2010-2011, and its future strategic direction.

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