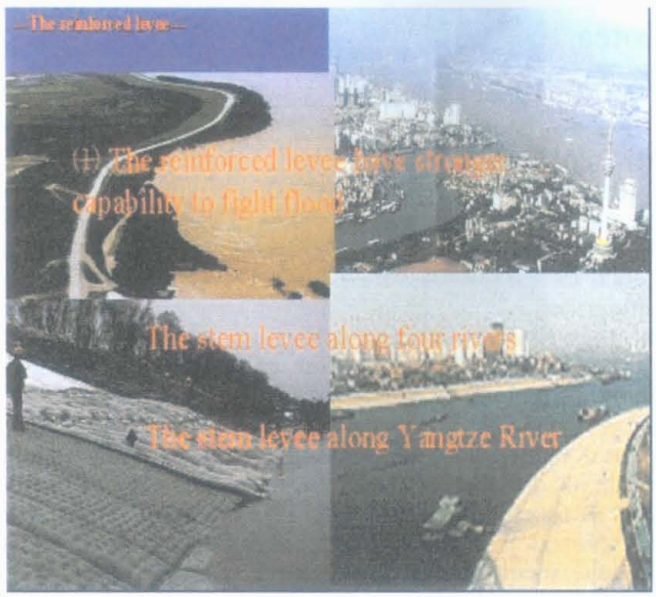

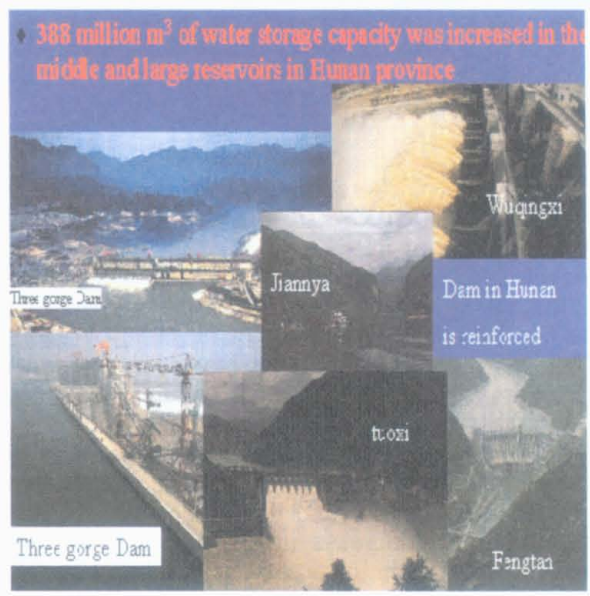

- **Background**
  China is a country that suffers from frequent floods. In 1998 flooding along the Yangtze River and Songhua River caused severe loss of life and property and caused billions of dollars-worth of economic loss to the country. In 2002, there was heavy rainfall in Hunan Province. Unlike other years, however, there was no disaster other than flood.

- **Objective**
  To review government practices including policies and flood control measures in China after the 1998 floods.

- **Term/Time Frame**
  After the 1998 floods.

- **Activities Undertaken**
  In response to the floods, the State Council made timely proposals for several strategies for flood prevention and control. These include the following series of policies and measures: enclosing mountains to plant trees, transforming land back into forests, demolishing polder fields to channel flood water, transforming farmland back into lake, supplying laid-off laborers for reconstruction, relocating people to form new townships, reinforcing key dykes and dredging river beds.

- **Major Achievements**
  The report concludes that five changes have resulted. (1) The flood defense capability of the lower and middle parts of the rivers has increased. (2) The benefits are far greater than the investment. (3) Local socio-economic development is effectively booming. (4) The income of local people has increased. (5) These flood control measures promoted harmonious coexistence between human beings and nature.

- **Total Budget**
  In the last 5five years, US$18.73 billion for disaster relief, disaster rehabilitation and management. US$440 million used to strengthen the Yangtze River Dyke.

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Korea

Disaster Impact Assessment System in Korea

Since 1996 Korea has been carrying out a disaster impact assessment program. The Disaster Impact Assessment (DIA) system aims at fundamentally eliminating potential causes of disasters inherent in various development projects in advance and ultimately protecting people's lives and property. The DIA was introduced to protect lives and property in downstream areas from the impact of large-scale development through disaster prevention facilities such as retention reservoirs in development areas. In 2001, the DIA's coverage was expanded and it was integrated with other impact assessment programs such as environmental impact assessment based on the Impact Assessment Act for Environment, Transportation, and Disaster. However, since their purposes and techniques differ, each impact assessment program is reviewed and regulated separately despite their legal integration.

The Disaster Impact Assessment program is one good example of the implementation of sustainable development. When a development plan is proposed, its disaster potential in such areas as increased flooding, sediment yield and slope stability problems is thoroughly reviewed. The main objective is to minimize any increase in the potential for disaster caused by the development by using appropriate facilities and techniques such as building a sediment-yield retention area during construction.

The disaster impact assessment system is implemented when the area of targeted development is 300,000 m^2 or more. With respect to small and medium-sized development projects (150,000–300,000 m^2), each city and province has introduced a local disaster impact assessment system. Currently, DIA is applicable to 24 categories in six fields such as urban and industrial development and the development of tourist attractions and mountain areas. Up to November 2004, 186 development plans had gone through this important program.

A part of the construction process of a retention reservoir required by the DIA

Even though Korea operates the DIA effectively, the program needs to be updated and improved. Continuous urbanization and industrialization may necessitate expanding the categories of DIA to reflect climate change, design frequency, and changes in land use. To ensure a fundamental reduction in disaster-causing factors in land development, a "Pre-Consideration and Deliberation System on Disaster Impact" is to be introduced. The purpose of the new system is to define new categories, including future directions and detailed plans for operation. It is still under development, with many experts carrying out systematic research.

Sustainable development can be defined as development that does not increase disaster potential or vulnerability. However, to develop any area without any disturbance is almost impossible. To reduce disaster factors due to development, regulations should be considered that safeguard not only the development site itself but also areas downstream. The Disaster Impact Assessment system currently in force in Korea is effective in reducing disaster factors and offers be a good example for implementing sustainable development.

Reservoir during normal circumstances

Reservoir during the rainy season

- **Background**
  A reduction in possible disaster factors from development was required.

- **Objective**
  The system aims for the fundamental elimination in advance of potential causes of disasters inherent in various development projects, ultimately protecting the lives and property of people both at the development site and other areas.

- **Term/Time Frame**
  Begun in 1996 and expanded in 2001. Current research on the "Pre-Consideration and Deliberation System on Disaster Impact" will be finished by February.

- **Activities Undertaken**
  Continuous updating and research for improving the guidelines on how to measure, predict, and find appropriate countermeasures for disasters are under development.

- **Major Achievements**
  So far, 186 development plans have gone through the DIA program. DIA is applicable to 24 categories in six fields including urban and industrial development and the development of tourist attractions and mountain areas

- **Total Budget**
  The budget is determined by law, and, each DIA therefore requires private funding from contractors. Generally the DIA system requires about US$100,000 or more depending on the size of development.

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3.2.3 Improvement of Information Sharing and Management

Japan

Lessons Learnt from The Great Hanshin-Awaji (Kobe) Earthquake: National Government Countermeasures and Disaster Information Systems

1. Introduction

An earthquake occurred on January 17, 1995 in Kobe, Japan. The magnitude was only 7.3 on the Richter scale, but it happened directly underneath a metropolitan area. It killed 6,400 people, injured 44,000, and destroyed 518,000 houses. At its height, 317,000 people evacuated to schools and public places. Most of the damaged infrastructure was buildings. Even reinforced concrete buildings collapsed. The estimated damage was about 10 trillion yen or about US$85 billion. Of this, about 60% was accounted for by damage to buildings. The most heavily damaged area was the city of Kobe, the capital of Hyogo Prefecture, which is the center of the prefecture's political and economic activities.

2. Lessons Learnt

Because the earthquake hit the capital of the prefecture directly, the initial response was very slow. Not only the prefectural offices, but also almost all traffic systems and telecommunication systems including satellite telecommunications were destroyed. It therefore took almost three days for the national government to grasp the full extent of the damage. Hence it delayed its initial response.

As a countermeasure for the delay in initial response, the national government established a cabinet information collection center. At the same time, it appointed a Minister of State for Disaster Management and Chief cabinet secretary for Crisis Management. The government developed a disaster information system, which consists of an Early Estimation System and an Emergency Measures Support System.

3. Disaster Information Systems

The Japan Meteorological Agency (JMA) and local governments developed seismic intensity observation points with seismographs. There are about 3,000 observation points nationwide. Based on the information from those observation points, the government developed Early Estimation System and Emergency Measure Support System.

Figure 1 illustrates the Disaster Information System. After the earthquake, the government first estimates the damage such as number of deaths, injured, collapsed houses and so on. Then the government estimates the needs of support in terms of materials, manpower for rescue and rehabilitation, hospital beds, evacuation camps etc.

The estimation system is based on population, building structure information, ground conditions, time of occurrence and survey of persons using transport. Normally persons using transport are excluded from the estimation.

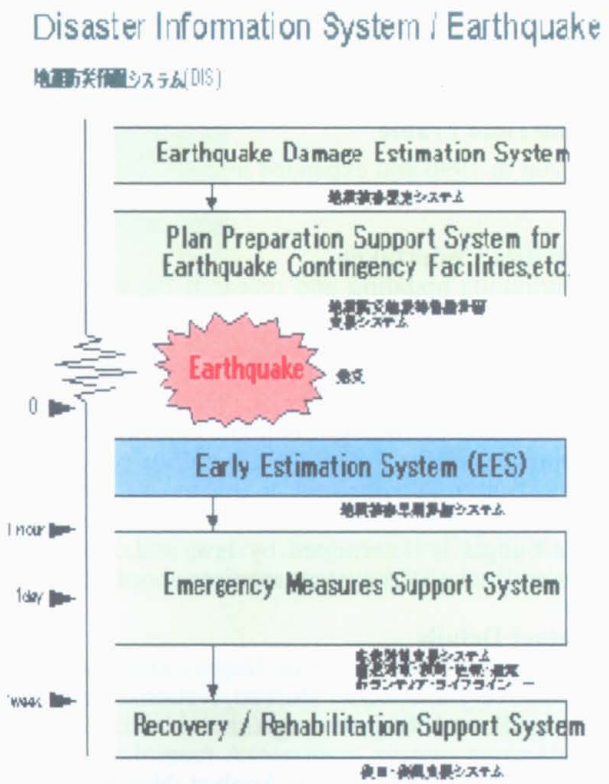

Figure 1: Earthquake Disaster Information System