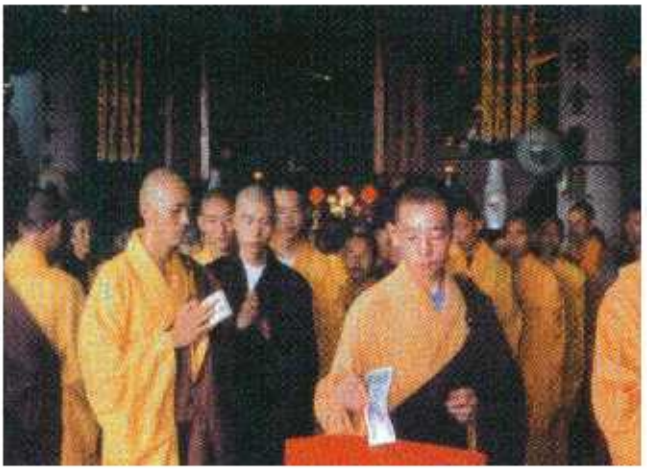


Monks are donating

2. The Ministry of Civil Affairs and the local bureaus under it organized the work carefully and made thorough propaganda.

During the process of the donation, the Ministry informed the public of the way to donate by all means It also reported the reception and allocation to the public, with the cooperation of mass media that traced the whereabouts of the donations and made series of reports.

3. All departments concerned worked in close coordination and non-governmental institutions and societies took an active participation.

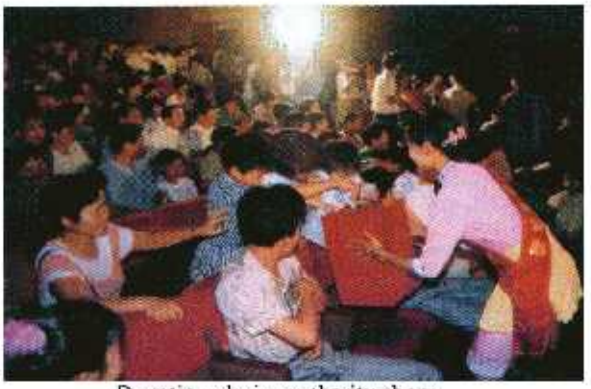
Officials from the customs, diplomacy, Hong Kong and Macao Affairs Office, railways, communications, banks, post offices and telecommunications, etc, took special measures to simplify the procedures, give top priority to the most urgent and special work Mass media reported the condition in disaster areas and the reception and allocation of donations timely, and their propaganda enhanced the donation work.

4. An appeal for aids was made to the international society.

An expert team for disaster assessment from the UN was invited to the disaster areas to make on site investigation They got the first-hand information about Chinese people's great courage and strength in combating natural disasters, about our government's tremendous achievements in disaster relief, and about the system of donation reception and allocation that ensured exclusive utilization of all the relief funds and materials on the affected people. They also communicated the information broadly to the international societies, thus in turn, laying a solid ground for attracting foreign donations.

Disaster Relief Donation in 1991

Ministry of Civil Affairs



Donation during a charity show

In the wake of severe flood in the East China in 1991, the Chinese government made timely and resolute decisions to appeal for urgent assistance from abroad and launch disaster relief donation domestically. From July to November, 1991, 2.3 billion yuan RMB were collected (including 610 million yuan RMB worth of materials), which is equivalent to 2.3 times of donation in a normal year. The governments at different levels vigorously organized and mobilized the donation activity and took a leading role. People from all walks of life and from all ethnic groups were active in contribution, carrying forward the Chinese nation's traditional virtue of mutual help. People of Chinese origin all over the world showed and reinforced great fraternity and strengthened the cohesion and unity of the whole Chinese nation. International assistance was also increased dramatically.

Reviewing the process of donation for 1991 disaster relief, we found that:

1. Appealing for aids from abroad and mobilizing donations at home is very important to the reform and socialization of disaster relief and they are of great significance to quicker and better solution to the problems in disaster areas. Many foreign non-governmental organizations, enterprises and associations enhanced contact and cooperation with China through donation.

2. Better collaboration among different government agencies is the key for a better relief and donation work. For example, a series of special policies and measures were made concerning the donations' initiative, reception, administration, allocation, utilization and personnel beyond the geographic border. All these policies and measures guaranteed the smooth transportation of donations to the affected people.

Appealing to international communities for assistance

3. Open procedures and strict disciplines are important for the whole affairs of donation reception and administration. To ensure the success of the donation work, the Ministry of Civil Affairs together with all departments concerned, formulated detailed procedures with regard to donation reception and allocation before appealing for assistance. During the process of the donation activity, all the related departments ranging from foreign stationed agencies to domestic institutions, performed their functions strictly according to the relative regulations. The Ministry of Civil Affairs and its local bureaus, who were in charge of donation reception, persisted in writing out receipt and gratitude letters immediately after they received the donation. To every lot of donation, they would inform the affected people of the donator and concrete amount and inform the donators of the whereabouts of the donations in return. The allocation of donations was publicized by the mass media to the public, accepting supervision and auditing by society and the departments responsible.

The Ministry of Civil Affairs, conforming to the State Council's requirement, insisted in using the donations in emergency relief, transformation, arrangement of the affected people's life and rebuilding of their homeland. Following the principle of timely allocation and main point superiority, it allocated most of the domestic donations to Anhui, Jiangsu, Hubei, Zhejiang and Guizhou which were most seriously affected, and allocated most of the foreign donations to Anhui, Jiangsu, Henan, and Zhejiang.

The donation work was carried out under strict discipline and high degree of openness. Donations were allocated promptly with key points being emphasized. All these brought about immense economic and social benefits.

Prevention and Control of Geological Hazards within Three-Gorge Reservoir Area

Ministry of Land and Resources

Geological hazard control project(a)

In the Three-Gorge Reservoir area, there are high mountains and steep slopes with complex geological conditions and serious geological hazards such as collapses, landslides and debris flows. To date 1,500 rockfalls, landslides and deformable bodies have been ascertained, with total volume of 3.5 Ga cubic metres and more than 90 debris flow trenches.

The Chinese government pays special attention to prevent and control of the geological hazards in Three Gorges Reservoir area. Since the beginning of the 10-year hazard reduction, investments of 400 million yuan RMB have been made successively for more than 10 geological hazard control projects in Hubei, Chongqing etc., and all these have achieved significant social and economic benefits. Lianziya dangerous rock mass and Huanglashi sliding mass control projects are the most representative ones and so far also are the largest geological hazard prevention and control projects in China.

Lianziya dangerous rock mass and Huanglashi sliding mass are two large-scale hazardous masses with the lowest stability at the key positions in Three-Gorge of the Yangtze River. They directly threaten the safety of shipping in Yangtze River and residents in towns nearby and impair economic construction in the upper reach regions. Through hard efforts for 6 years, the essential parts of the projects have been completed.

Lianziya dangerous rock mass, 25 km from Three-Gorge reservoir dame (Sandouping), is a separate rock mass cut by 58 wide and long fissures. It occurs in a steep limestone slope bottomed by a 2-4 m-thick coal bed on the right bank of Yangtze River and is formed by the excavation of coal and the unloading of the steep wall. The rock body has a total volume of 3.15 million cubic metres.

To counter possible deformation damage by the dangerous rock mass, the following measures have

Geological hazard control project(b)

been taken: supporting the mined-out coal zone, preventing its slide, reinforcing the overlying hazardous rock body by anchoring, surficial water drainage, holding back blocks from falling into the river, monitoring rock deformation. Most parts of the above projects have been completed. Monitoring data show that deformation trend of the dangerous rock mass has been brought under effective control.

Huanglashi sliding mass is a group of composite sliding masses with multiple types, levels and stages of activity and consisting of sandstone and mudstone with intercalated marl, with total volume of 40 million cubic metres. Dashiban landslide in the west shows the lowest stability with the volume of 4 million cubic metres.

Because the main reason inducting deformation damage is infiltration of rainwater, preventive measures dominated by drainage (surface and underground) were taken. So far 15 surface drainage channels with total length of 7 thousand metres and an underground drainage adout 340m in length have been built, playing a good role in stabilizing landsides.

The two projects mentioned above have provided a case study and accumulated experiences for prevention and control of geological hazards both in Three-Gorge reservoir area and in the whole country. Accordingly, the Ministry of Land and Resources is implementing and planning implementing new monitoring, prevention and control projects, so as to further strengthen prevention and control of the geological hazards within Three-Gorge reservoir area.

Prediction and Prewarning for Storm Surge: A Case Study

State Oceanic Administration

Houses ruined by typhoon

Typhoon 9711, generated at 08:00, August 10, 1997, in the east of Guam, landed at 21:30, August 18 on Zhejiang Province with a wind force of over scale 12 and an air pressure of 960 hbar at its center. After landing, the typhoon turned toward the north, and entered Jiangsu Province, then entered Shandong Province and the Bohai Sea. It decayed at 21:00, August 21 in Liaoning Province. As a result of the simultaneous occurrence of strong wind, spring tide and heavy rain, the landing of Typhoon 9711 at the coastal area of the eastern China caused unprecedented disaster, which affected a large area seriously. Observations at the coastal stations during the storm surge indicated that the high tides measured at 28 stations exceeded the local warning limits and the high tides at 13 stations broke the historical records.

Forecasting of the storm surge caused by Typhoon 9711

A prediction of the storm surges to be caused by typhoons in 1997 was made in early year. It was that the impact of tidal disasters would extend further toward the north in 1997 than in the previous years. On the basis of the analysis of historical data, experts concluded that there would be less typhoons in 1997, but the probability of typhoon's impact on the coastal area of the eastern China would be higher. This prediction was made to the public to raise the public's awareness of coastal disasters and to call for precautionary measures against the disasters. When Typhoon 9711 entered the area identified as an area of importance for typhoon forecasting and warning, the marine environmental forecasting stations and centers concerned enhanced their consultation and gave full play to their expertise to provide parameters for typhoon forecast. They used storm surge numerical forecasting models to calculate the path of the typhoon, and issued a forecast of the extraordinary storm surge with a lead-time of 36hours.

Heavy rain brought about by typhoon

Application of the warnings of the storm surge caused by Typhoon 9711

The timely and accurate warnings of Typhoon 9711 provided important information for the local authorities and the public to prevent and mitigate the impacts of the storm surge caused by this typhoon. As a result of the measures taken by the authorities at various levels based on the warnings from the forecasting institutions, the casualties in the impacted coastal areas were minimized. The total casulties are about 200, which is a rarely low figure in the history of storm surge disaster mitigation in China.

Measures or factors which played important role in the storm surge disaster prevention and reduction

1. The highly efficient and advanced ocean observing system provided a large amount of accurate data for the forecasting institutions when and after the typhoon was formed.

2. The marine environmental forecasting and warning system provided accurate warnings of the typhoon-caused storm surge, which helped the local authorities understand the forthcoming threats of the disastrous storm surge and and take precautionary measures in disaster reduction and mitigation.

3. The authorities at various levels paid great attention to coastal disasters. Prior to the approaching of the storm surge, arrangements were made to enhance patrol of dikes, dams and coastal defence works so as to ensure their safety. Army, police and civilians were organized to form contingency teams against disasters. People in the areas affected by storm surge disaster were timely evacuated. Consequently, the losses were minimized.

4. Dikes and dams of high standards were built. Along the coastal line of 18,000 km, defence works with a total length of around 13,000 km have been built since 1950, among which 5757 km are of high standard. These defence works have displayed their enormous economic and social benefits.

Hazard Reduction with Mass Monitoring and Prevention in Changyang, Hubei Province

Ministry of Land and Resources

Propaganda activities

Changyang County is located in a mountainous area, where mountains are high, slopes steep, valleys incised. Neotectonism appeared frequently, and geological hazards such as rockfall avalanches and landsides often occurred. There are 283 places prone to geological hazards which threaten 2,895 households of 15,748 farmers, 720 ha cultivated land and 628 ha forests. The county therefore carried out the mass monitoring and prevention activities of the all people's hazard reduction.

In 1992, investigation of the status quo of geological hazards was completed throughout the county. A report on prevention and control plan of the geological hazards in Changyang County was compiled. Short, middle and long term objectives of the prevention as well as control and main measures which are required to achieve these objectives were decided. First, secondary and ordinary areas where the prevention and control will be made were divided. Relatively concrete proposals were made for prevention and control of serious geological hazards in 7 major spots. In 1998, a draft plan for prevention and control of geological hazards in flood seasons in Changyang County was formulated.

To implement hazard reduction and prevention, teams of prevention and control of geological hazards at both county and town levels were organized in the county. In accordance with the principle that "who is threatened by geological hazards is obligated to monitor", one or two people are appointed as compulsory monitors for each geological hazard spot, who are responsible for monitoring deformation in the spot. So far, four levels of responsibility including country, town, village and monitor levels have formed a monitoring network of geological hazards with 258 measuring points and 260 full-time and compulsory monitors. In recent years, more than 3,500 monitoring data have been collected.

Changyang County also broadcasts records and lectures on popular scientific knowledges about prevention and control of geological hazards with the aid of television and radio stations, posts and slogans in the streets and villages and spreads propaganda of relevant knowledges among the masses for more than 120 times, with 18 thousand of people being educated. In recent years, seven training courses in prevention and control of Geological hazards have been held, in which totally some 150 cardres and compulsory monitors from the county and towns were trained and attended lectures on the popular scientific knowledges and monitoring methods of geological hazards. These activities heightened the masses' consciousness of hazard prevention and improved their ability to prevent geological hazards. The broad masses of the people can invitiatively avoid inducing geological hazards and give the alarm promptly whenever finding a dangerous sign of geological hazards, thus winning the time for guarding against occurrence of the hazards and reducing the resultant damage.

Because emergency investigation of geological hazards is a key link in prevention and control of the hazards, an emergency investigation team consisting of specialists was organized. In recent years, the team has made emergency investigations in 110 places, presented 110 reports on the emergency investigations. Because of its proposals safty of more than 4800 people was safegarded and the hazard damage cost was reduced by 65 million yuan RMB. In 1997 situation of geological hazards became worse in Xizhai Village of Yazikou Town, and a sliding mass started to slide down 3 months later. Because the local government promptly organized migration before the event according to the proposal from the emergency investigation team, no injury and death occurred, and property damage was also minimized.

In the past 3 years, the county has raised nearly 1 million yuan RMB through various channels for control of the hazards; instructed those responsible parties to invest more than 4 million yuan RMB according to the principle that "who causes the hazards controls them"; and taken measures that the mass go to work, the society offers financial assistance and taxes are reduced or remitted to carry out local control of the hazard. The practicl has achieved good results and recognized by the society.

Promoting Dry Land Farming Techniques in Arid Areas

Ministry of Agriculture

Micro-scale project for water conservancy

China is a water deficit country with per capita water availability of only about 2,400 m^3, 1/4 of the world average. The annual national average precipitation is around 650 mm which is also below the world average. Dryland makes up 50% of the 95 million ha of total farmland. The northern arid areas have less than 450 mm of annual rainfall in average. Drought would attack these areas in nine out of every ten years. In spite of some 1,000 mm of annual precipitation, the tropical and sub-tropical rain-fed areas in the South still suffer from serious drought during the critical growing stage when the crops need water The water shortage poses as a major constraint to the final yield. In the past ten years, more than 20 million ha of crops suffered from drought annually, causing 10 to 25 million tons of grain losses

Given water scarcity, poor soil, water & soil erosion and extensive farming in arid areas, the Chinese government has always attached great importance to agricultural development in these areas. The government has regarded the development of dryland farming as the strategic means to alleviate water shortage and promote the sustainable development of agriculture and rural economy. The dryland farming techniques adopted by various localities are mainly as follows:

* Building up terraces and embanked field of various types and carrying out watershed management in order to thicken active soil layer and reduce water loss and soil erosion by soil improvement and water retention as the key measures. By doing so we can increase grain production capacity by over 4 million tons.

* Leaving crop straws and residue in the field to improve soil structure and fertility, retain water in the field and readjust soil moisture.

* Mulching by plastic film could remarkably improve the ecological conditions of farmland in arid areas and increase production. Currently, the total acreage of farmland using plastic film for mulching is close to 7.33 million ha, increasing crop yield by over 3 kg per hectare for every millimeter of rainfall.

* In the North, mulching by crop straws and stalks could not only prevent evaporation but also help raise soil temperature, improve fertility and as a result increase grain yield by 20%. Techniques such as minimum tillage, zero tillage as well as hole and furrow sowing of wheat adopted in recent years have all contributed to retain soil moisture and improve use of water.

* The implementation of the Seed Project can increase grain yield by over 10% through developing, introducing and utilization of improved seeds with strong resistance to drought and popularizing crops featuring water saving, drought resistance, cold resistance and high yield.

* Mechanized farming has the advantages of saving labor, time, cost and increasing yield. In 1994, Shanxi Province adopted mechanized farming for about 143,000 ha of dryland, which achieved an average yield of 5475 kg per ha for the autumn crop despite of the serious drought the province suffered in that year, up by 13% to 19% over the previous year.

* New types of drought-resistant agents, water retention agents, evaporation suppressant, soil regulator and crop growth regulator can be used to increase yield. For instance, seeds treated with water retention agent can raise yield by 0.1 kg for every millimeter of rainfall. Wheat seeds treated with Drought-Resistant Agent No. 1 may produce 20% more in yield.

The Ministry of Agriculture (MOA) has prepared the National Development Program for Water-Saving Dryland Farming and many local governments have also worked out their own development programs suited to the local conditions, laying a good foundation for integrated economic development in arid areas.

While improving efficient use of rainfall, the local governments have taken positive support measures through farming system reform and water-saving irrigation to form a technical system with water saving as the core element and other agronomic measures as supplementary ones. All these measures have brought significant results in saving water and raising yield.

Many provinces and municipalities have listed dryland farming development on their government agenda. MOA has set up 68 demonstration bases for water-saving dryland farming in major arid areas of the country. Step by step, we have gained successful experience in establishing a dryland farming technical system by combining engineering measures with non-engineering measures.

Forest Fire in Inner Mongolia in 1998

State Forestry Bureau

People were fighting the forest fire

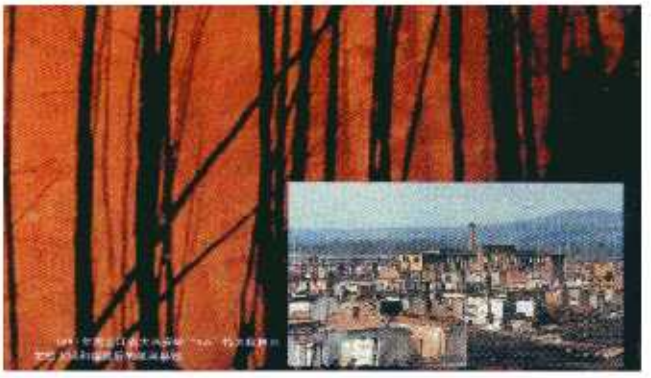
At 13:50, May 13th, 1998, a forest fire caused by lightning broke out in Arshan Forest Bureau, Inner Mongolia. Over 12,000 hectares were burned in which 6,750 hectares were forested land. Difficulties were confronted in following aspects when fighting the fire: the harsh climate, the varied topography and the over fuel loading.

Senior officers from State Forestry Administration and Inner Mongolia Autonomous Region Government directed the fire-fighting on the spot. On May 22, 1998, the fire was completely suppressed after nine-day fighting conducted by soldiers, police and local people through integrated approach of air-tanker, artificial rainfall and ground suppression of forest police, soldiers, forest fire fighting crew and forest workers. More than 6,000 crews were involved in which 2,750 are forest police, 300 soldiers, 3,500 forest workers and forest fire fighting crew and over 4,000 logistic staff. A large number of equipment were mustered, among which there were 12 helicopters, 3 crafts for artificial rainfall, 4 cruisers, 1,138 vehicles, 1,205 pneumatic extinguishers, 300 fire pump and 218 radio transmitters.

Great importance has been attached to forest fire prevention by the Chinese government and remarkable results have been achieved since 1988 in following aspects:

1. Intensification of fire prevention infrastructure

So far a complete set of command centres and working bodies for forest fire prevention have been set up in whole China with more than 2,900 forest fire command centres over county level, over 3,000 working bodies, over 13,000 check points for fire management, over 7,000 watch towers, over 700,000 kilometer fire-break established, and a set of equipment for communication, transportation and fire suppression disposed. Four regiments of forest police on active service, eighteen aerial surveillance



Forest and towns after fire

plane airstrips were found, and over 9,300 professional or semi-professional fire fighting teams, 146,000 voluntary fire fighting teams were formed. An integrated system for computerized forest fire danger prediction and forecast, monitoring, forest fire tracing and positioning, geographic and resource information, decision-making auxiliary and communication information, etc. has been set up in command centres of various levels. At present, 29 provinces(autonomous region and municipality) and 137 key fire prevention region have got on the internet.

2. Enhancement of forest fire prevention

First, forest fire prevention has been shifted from sole responsibility of forestry sector to the present status of shared responsibility of relevant departments and the whole society under unified leadership of various governments.

Second, the principle for fire suppression has been changed from involving the mass in passive fire fighting to active fighting based on the policy of prevention first and active suppression. The management of fire origin and the enhancement of fire prevention consciousness of the people is applied in prevention, and the approach of early fight by professional teams is applied in suppression.

Third, the method of pure administrative management is changed over to integrated management combining administrative, economic and legislative methods.

3. Implementation of preventive measures

During fire season, mountains in key forest regions are closed from idlers and from using fire; focus is be put on resorts; vehicles entering forest are equipped with fire prevention device; train is cleaned in designated place; fire planes should be set around residential area, working area, warehouse and oil depot. Ecological barriers have been widely established in forest regions in southern China to prevent the fire from further expansion.

Synthetic Scientific System of Serious Atmospheric-Hydrosphere Disaster Reduction

The Center of Disaster Reduction, Chinese Academy of Sciences

As a demonstrating project of " China Disaster Reduction Center ", Synthetic Scientific System of Serious Atmospheric-Hydrosphere Disaster Reduction (SSSSAHDR) was established. Prof. Wang Ang-Sheng led more than 20 Institutes and Universities, more than 200 scientists and engineers to finish the system which will reduce mainly Typhoon, Heavy Rain and Flood Disasters. The System obtained economic benefit about 200 million USS from disaster reduction about 5 years, thus became a famous important system in disaster reduction.

SSSSAHDR consists of six parts, i.e. Forecast-Warning Service System, Disaster Information System, Synthetic Database, Assessment System, Countermeasure System and Six provinces demonstrating Systems.

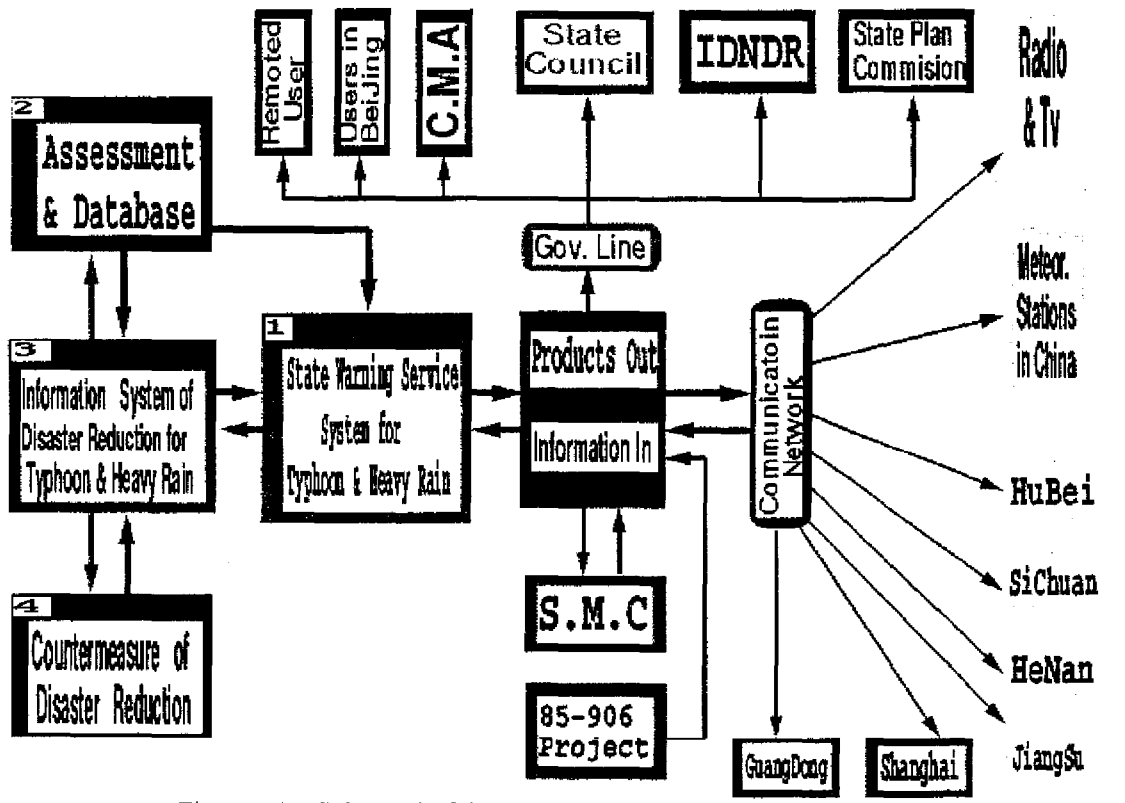


Fig. 1 The Schematic Diagram of SSSSAHDR.

The characteristics of the system are as following:

This system's nucleus is to hold the serious disaster day by day;

The system operates continually by real-time (from June 1 to Sept. 15, every year);

Forecast and Assess serious disaster (where, when, losses etc.) early 1-3 days;

Collect all kinds of disaster information by real-time;

It has synthetic database of which the characteristics are real-time information database and economic-social database etc.;

It has six local demonstrating systems in Hubei, Sichuan, Henan, Jiangshu, Guangdong province and Shanghai city.

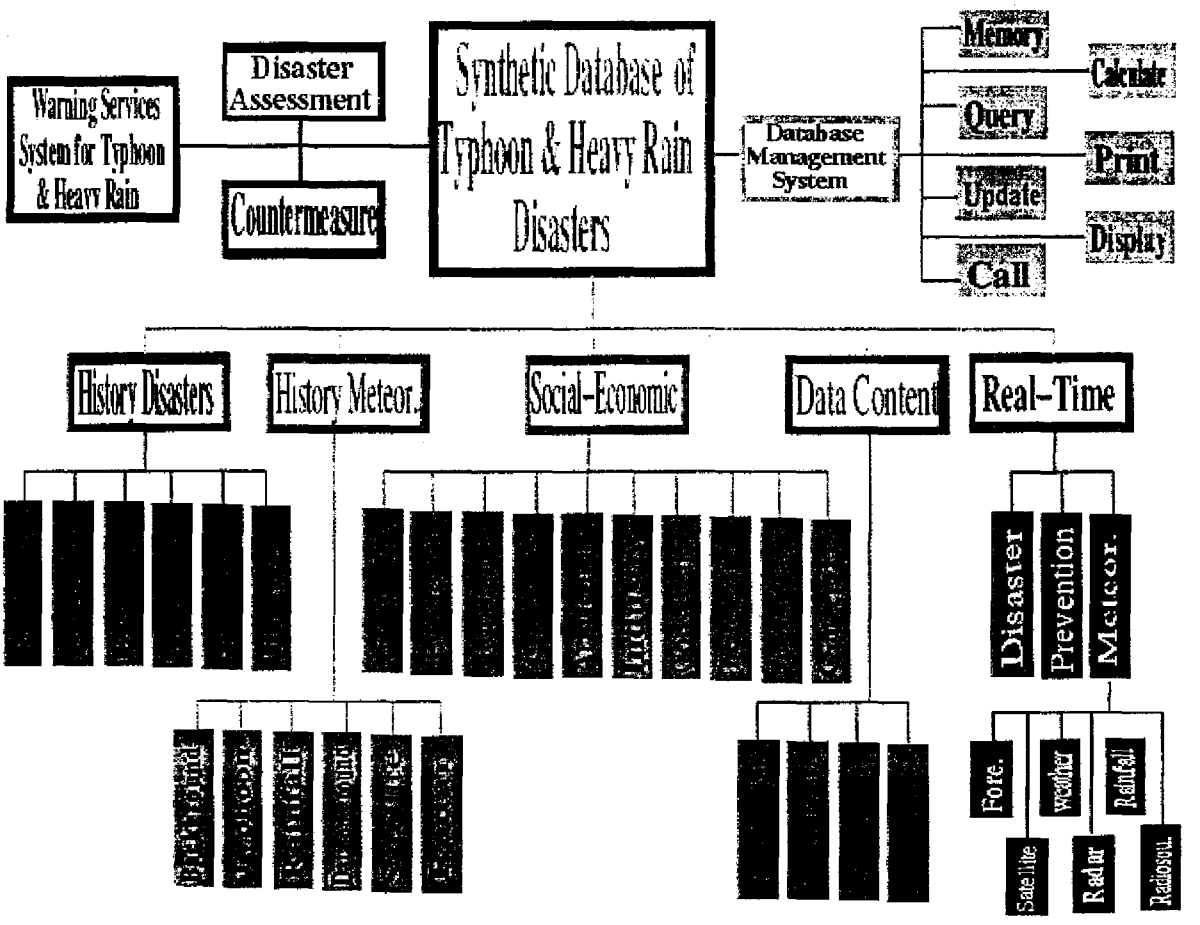


Fig. 2 The Schematic Diagram of Synthetic Database of SSSSAHDR.