

Natural Hazards and Disasters in China

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A database system for natural hazards and natural disasters for China's 2364 counties has been set up with six subsystems : 1) natural hazards, 2) modern natural disasters (1950-1990), 3) disaster losses in regional agriculture, 4) historical natural disasters (1501 -1949), 5) economic status, and 6) country administrative division of China (1990). Information from this integrated system is used to generate a set of maps that identify regionalizations of natural hazards and disasters in China.

The eastern part of China has more natural hazards than the west. But the western area is not nearly as conducive to human habitability and the eastern part.

There are many types of natural hazards identified in the database, including meteorological hazards such as wind storms, marine hazards such as red tide and storms, geological hazards such as landslides and severe soil erosion, and biological hazards such as plant diseases and insect pests.

In maps created using this database, different colors or shading techniques are used to designate different types of hazards. For example, in one map, red designates earthquakes and the size of the red spot on the map reflects the magnitude of the disaster. This map reveals that earthquakes are primarily distributed in three areas, the western, northern, and southwestern areas of China, with a few in the southeast coastal zone.

In order to see how agricultural areas are impacted by natural hazards, a map of agriculture areas is overlaid with a map of natural disasters. This analysis reveals that the agricultural areas of the north, northeast, and southeast coastal zones are most affected by natural hazards. A similar analysis is performed for forest areas.

Each of the six sub databases in the Database System for Natural Disasters in China is based on appropriate sources of data, the major contents of each sub database varies based on the credible information available. For example, if newspaper accounts are the major source, only three parameters can be trusted to always be correct: time, area, and type of disaster, so only these three are used.

For other sub databases, information comes from statistical materials on disaster losses, written records from water conservancy departments and meteorological departments, etc.

Regionalization principles and methods

In regionalizing natural hazards and disasters, three principles are considered:

1 differentiation of natural disaster system: hazards, hazard-formative environment, hazard-affected bodies

2 differentiation of hazard and disaster intensity

3 Integrity of country administrative boundary division

Index System :

. Stability of hazard-formative environment. The land forms of the east, middle, and western high plateau, mountains, and basins are clearly distinguished from each other in climate and topography.

. Complicity and intensity of natural hazards: formulas are included to account for: hazard

diversity, hazard intensity, hazard area index, hazard index, disaster diversity, ratio of disaster times, disaster years, disaster index

. Stability of hazard-affected bodies : formulas included to account for agricultural population density, grain output level, level of gross output value of agriculture, level of gross output value, methods

. combination of natural hazards: i. e., ratio of drought to flooding and water logging

Method of Regionalization

. cluster analysis

. regional comprehensive analysis

It is important to distinguish hazard from disaster A hazard is a natural physical phenomenon, Whereas disaster is generally related to the situation, such as What human activity is taking place on the site.

Figure 17.1 shows a map of China with the natural hazard index. Frequency and intensity of natural hazards go up with darkness on the map. It can be seen that hazard types differ in the different regions of China. The eastern part of China has more natural hazards than the west. But the western area is not nearly as conducive to human habitability and the eastern part. So despite the hazards, the physical environment is more desirable to more people. In general, from east to west the index decreases. Figure 17.2 shows a map of China with the natural disaster index. Frequency and intensity go up with darkness on the map.

Integrated hazard and disaster maps show distribution of natural hazards and disasters affected by land form, climate, and human activities. Regional differentiation of natural hazards and disasters is clear, but hazard distribution differs from disaster distribution in eastern China. Hazard intensity is the highest in middle-eastern China, but disaster intensity is the highest in the area between Huaihe River and Yangtze River in eastern China.

In China, great economic losses result from hazards and range from 3.3% of GNP to 6.1 % of GNP between 1989 and 1994.

Regionalizing natural disasters, China can be divided into 6 regions:

I Ocean Disaster Region

II Southeast Coastal Disaster Region (3.6%)

III East Mainland Disaster Region (20.7%)

IV Central Mainland Disaster Region (27.9%)

V Northwest Mainland Disaster Region (21.9%)

VI Qinghai-Xizang Plateau Disaster Region (25.9%)

These are then sub-regionalized in 26 sub-regions, and then sub-subregionalized into 93 districts.

The major natural hazards in China fall into four major categories,

. drought, flood and water-logging. tropical cyclones

. earthquakes, landslides, mud-rock flows

. disease and insect pests

. red tide, sea storms and waves

In conclusion, Shi pointed out that.

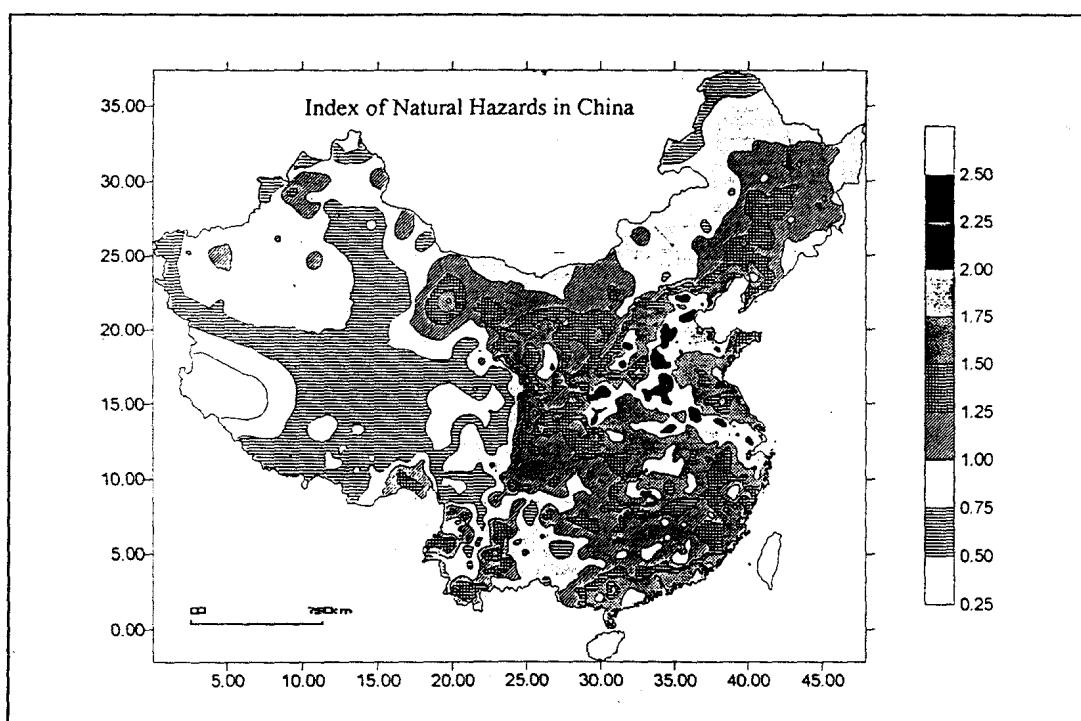


Figure 17.1
Index of Natural Hazards in China

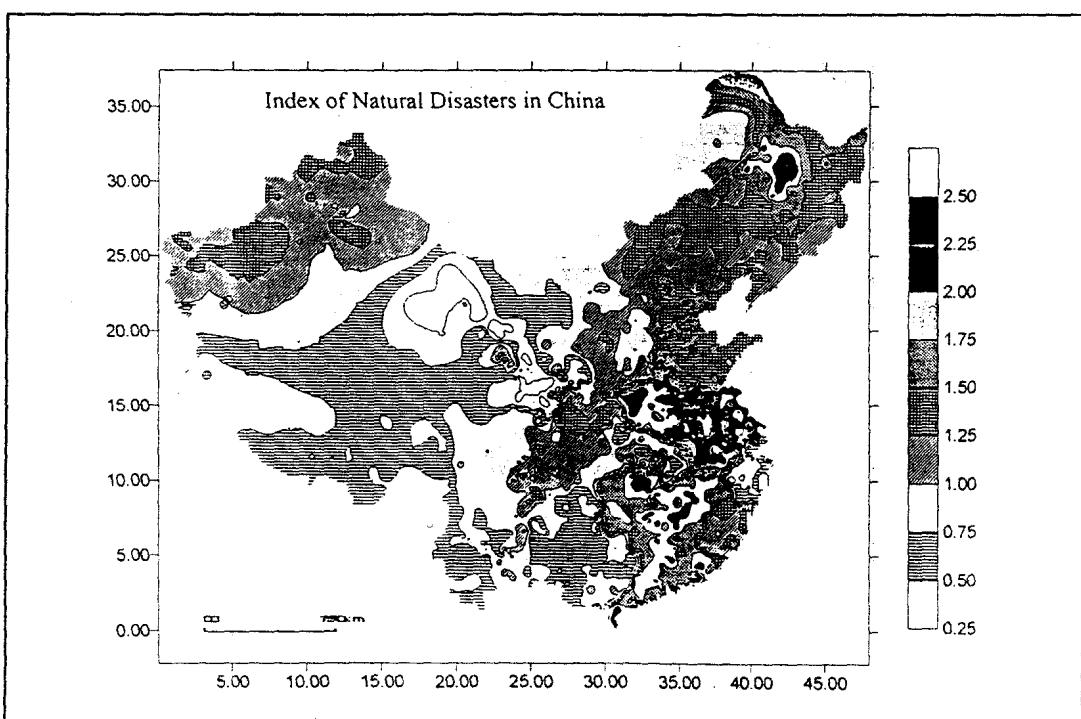


Figure 17.2
Index of Natural Disasters in China

- . Frequently occurring hazards cause great economic losses in China ranging from 3.3% of GNP to 6.1 % of GNP between 1989 and 1994.
- . It is very important to set up a disaster database for China. Disaster regionalization work is an important scientific base for disaster reduction.
- . It is important to study how natural hazards, natural disasters and human populations overlap and effect each other
- . The study of combinations and relationships between the different types of natural hazards and disasters is critical.
- . It is important to distinguish hazard from disaster. A hazard is a natural physical phenomenon, whereas disaster is generally related to the situation, such as what human activity is taking place on the site.