# CASE STUDY 8:

## An Atlas of Hazards and Disaster Risks to Support Disaster Risk Reduction in China


**Image 1:** Covers of the three Atlases of natural disaster risk in China. *Source: The People's Insurance Company of China, 19923, Shi, 20034 and Shi, 2011*[1].

## The problem

Covering 9.6 million square kilometres[2], and with the largest population of any country in the world, China frequently experiences a variety of hazards resulting in great casualties, economic losses and damage to infrastructure.

If the country is to introduce and maintain effective and appropriate disaster risk reduction, it must first understand the temporal and spatial patterns of the hazards and disaster risks it faces.

## The science

In response to the inauguration of the United Nations' International Decade for Natural Disaster Reduction in 1989[3], the Chinese government launched a project to produce an Atlas that integrates the vast array of scientific data on natural hazards and disaster risks available in China.

Data for the Atlas was systematically identified from a national database of natural hazard related disasters, official government statistics, and from newspapers and other media sources. Collated data was validated by scientists then brought together for spatial and temporal analysis of hazards, exposure and vulnerability in a comprehensive risk assessment process. This allowed disaster risks to be quantified, prioritised and communicated in an accessible, meaningful manner using learning from risk communication science.

The first edition, *Atlas of Natural Disasters in China*[4], was published in 1992. This was updated and improved in the 2003 *Atlas of Natural Disaster System of China*[5] and again in the *Atlas of Natural Disaster Risk of China*[6], published in 2011 (Image 1).

## The application to policy and practice

Since 1997, the Atlases have been used in the development of the Chinese Government's National Comprehensive Disaster Prevention and Reduction Plans[7–9].

For instance, analyses in the 2003 *Atlas of Natural Disaster System of China*[10] highlighted the regional variation of natural hazards across China and the projected trends of these (Figure 1). As a result, the

1 Shi P (Chief Editor). Atlas of Natural Disaster Risk in China. Beijing: Science Press, 2011.
2 Chinese Government. Official Web Portal, China Factfile, Land area [webpage]. Available at: http://english.gov.cn/2006-02/08/content_182551.htm [accessed 21 March 2013].
3 UNISDR. Disaster Reduction Mandate [web page]. Available at: http://www.unisdr.org/we/inform/resolutions-reports/disaster-reduction-mandate [accessed 21 March 2013].
4 The People's Insurance Company of China and Beijing Normal University. Atlas of Natural Disasters in China (Chinese and English versions). Beijing: Science Press, 1992.
5 Shi P (Chief Editor). Atlas of Natural Disaster System of China. Beijing: Science Press, 2003.
6 Shi P (Chief Editor). Atlas of Natural Disaster Risk in China. Beijing: Science Press, 2011.
7 China National Committee for IDNDR. The National Natural Disaster Reduction Plan of the People's Republic of China (1998-2010). Beijing: China National Committee for IDNDR, 1998.
8 China National Committee of Disaster Reduction. National Plan for Comprehensive Disaster Reduction During the "Eleventh Five-Year Plan" Period of the People's Republic of China. Beijing: China National Committee of Disaster Reduction, 2007.
9 China National Committee of Disaster Reduction, National Plan for Comprehensive Disaster Reduction (2011-2015) of the People's Republic of China. Beijing: China National Committee of Disaster Reduction, 2011.
10 Shi P (Chief Editor). Atlas of Natural Disaster System of China. Beijing: Science Press, 2003.

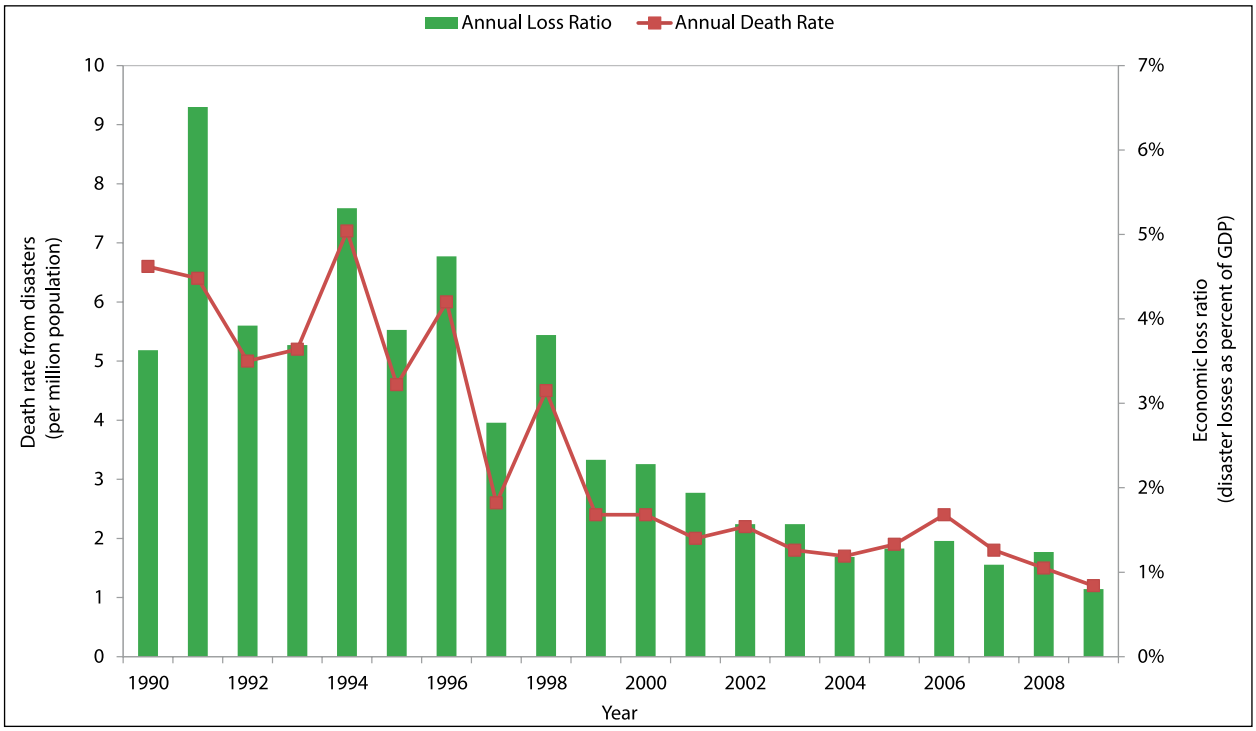


**Figure 1:** Loss ratios (economic losses from disasters expressed as a percentage of GDP) and death rates from disasters (number of deaths per million people) in China, 1990-2009. Data from the Wenchuan earthquake event, 2008, is not included. Based on data from Fang et al, 2011[11].

National Plan for Comprehensive Disaster Reduction During the "Eleventh Five-Year Plan"[12] introduced more regionally-focused plans and activities for disaster risk reduction in China.

In 2011, the *Atlas of Natural Disaster Risk of China*[13] was similarly used in the development of the plan for 2011-2015[14]. Based on the integrated natural hazard risk-mapping in the atlas, the plan laid out the task of building a multi-level, integrated disaster relief reserve system for China. This aimed to link central, regional and local activities in order to meet the Chinese government's commitment that people affected by disasters receive primary aid to sustain basic survival needs within twelve hours of a disaster striking.

At a local level, Shenzhen City, China's first Special Economic Zone, used local knowledge and experience with the Atlas' high-resolution maps of typhoon risk to develop its urban planning for disaster risk reduction policy. This policy supports the rapid urban development in the city whilst ensuring that buildings and infrastructure will be resilient to local hazards now and in the future.

The Atlases have also been used to inform disaster insurance policy and practice. For instance, the Chinese government's agriculture insurance program[15], launched in 2007, used the Atlas to inform regional crop risk assessment and premium determination. The Atlases are also widely used by domestic and international insurers, re-insurers and relevant stakeholders in the industry.

## Did it make a difference?

In the past 30 years, China has promoted and implemented disaster risk reduction, using the scientific evidence communicated in the three Atlases and with increasing emphasis on evidence-based risk assessment and on regional variations[16, 17]. The resulting efforts have significantly increased the regional capacity in disaster prevention and risk mitigation. This work is believed to be a contributing factor to the general decrease in annual deaths from disasters, and the reduction in relative economic losses, seen in China in the last two decades (Figure 1)[18].

11 Fang W, Shi P, Wang J. Integrated Risk Governance - Database, Risk Map and Network Platform. Beijing: Science Press, 2011.
12 China National Committee of Disaster Reduction. National Plan for Comprehensive Disaster Reduction During the "Eleventh Five-Year Plan" Period of the People's Republic of China. Beijing: China National Committee of Disaster Reduction, 2007.
13 Shi P (Chief Editor). Atlas of Natural Disaster Risk in China. Beijing: Science Press, 2011.
14 China National Committee of Disaster Reduction, National Plan forW Comprehensive Disaster Reduction (2011-2015) of the People's Republic of China. Beijing: China National Committee of Disaster Reduction, 2011.
15 Wang M, Shi P, Ye T, Liu M, Zhou M. Agriculture insurance in China: history, experience, and lessons learned. International Journal of Disaster Risk Science. 2011; 2(2):10-22.
16 Shi P, Shuai J, Chen W, Lu L. Study on Large-Scale Disaster Risk Assessment and Risk Transfer Models. International Journal of Disaster Risk Science. 2010; 1(2):1-8.
17 Ye T, Shi P, Wang J, Liu L, Fan Y, Hu J. China's Drought Disaster Risk Management: Perspective of Severe Droughts in 2009-2010. International Journal of Disaster Risk Science. 2012; 3(2):84-97.
18 Fang W, Shi P, Wang J. Integrated Risk Governance - Database, Risk Map and Network Platform. Beijing: Science Press, 2011.