

The Development of Catastrophe Insurance in China: An Exploration

Learning from Experience: Insights from China's Progress in Disaster Risk Management

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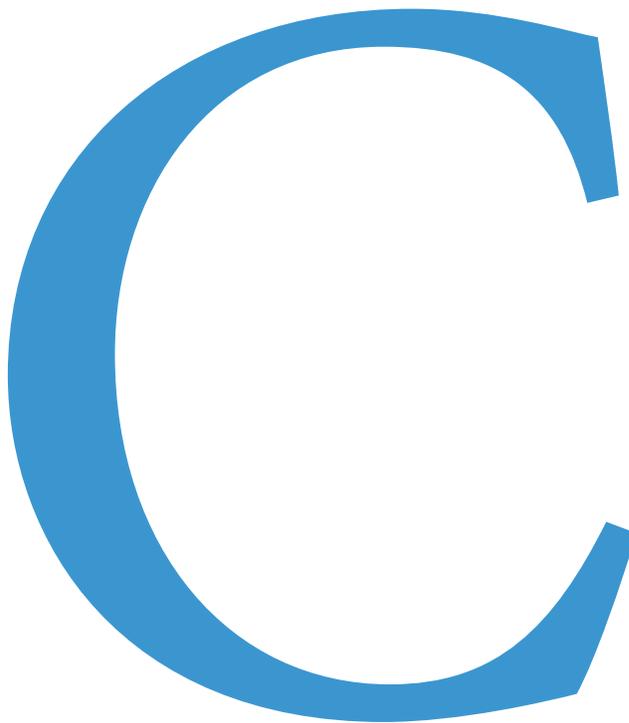
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China's system of compensation for catastrophic loss has relied heavily on government relief and public donations; insurance has played a rather weak role. According to Chinese government figures, insurance claims in China have historically accounted for less than 1 percent of direct economic losses in major large-scale disasters.

According to preliminary statistics, direct economic losses from the 2008 snowstorm and ice storm disaster, the 2008 Wenchuan Earthquake, and the 2010 Yushu Earthquake were 151.7 billion yuan, 845.1 billion yuan, and 64 billion yuan respectively; by contrast, insurance indemnity for the three disasters were only 5 billion yuan, 1.66 billion yuan, and 0.08 billion yuan, respectively.

Since the 2008 Wenchuan Earthquake, the Chinese government has recognized the importance of catastrophe insurance in ensuring rapid rehabilitation and recovery in the aftermath of a disaster. China is a large country with a vast territory, and its disaster risk profile is characterized by significant regional variation. In establishing a catastrophe insurance protection

mechanism, the Chinese government has accordingly put forward a national guideline that allows for local innovations and pilots based on local characteristics, with the goal of developing a system that fully addresses risk protection needs across the country (Figure 6.1).

Under this guideline, the country has laid the foundations for a diversified catastrophe insurance product system, which consists of both national standards and localized policies, single-peril (earthquake) versus multiple-peril, and indemnity-based and index-based types (Table 6.1). Besides, as the public in China still has a relatively low awareness and acceptance of natural disaster insurance (Wang et al. 2012), in some local pilots—including in Ningbo, Shenzhen, and

- 1 In the aftermath of the 2008 Wenchuan Earthquake, the Chinese government recognized the importance of catastrophe insurance in promoting rapid rehabilitation and recovery following a disaster.
- 2 China has since made significant progress in establishing a catastrophe insurance indemnity mechanism that allows for local innovations and pilots based on local characteristics.
- 3 Looking ahead, major challenges for catastrophe insurance in China include its very limited coverage and the underdevelopment of supporting techniques such as catastrophe risk models.

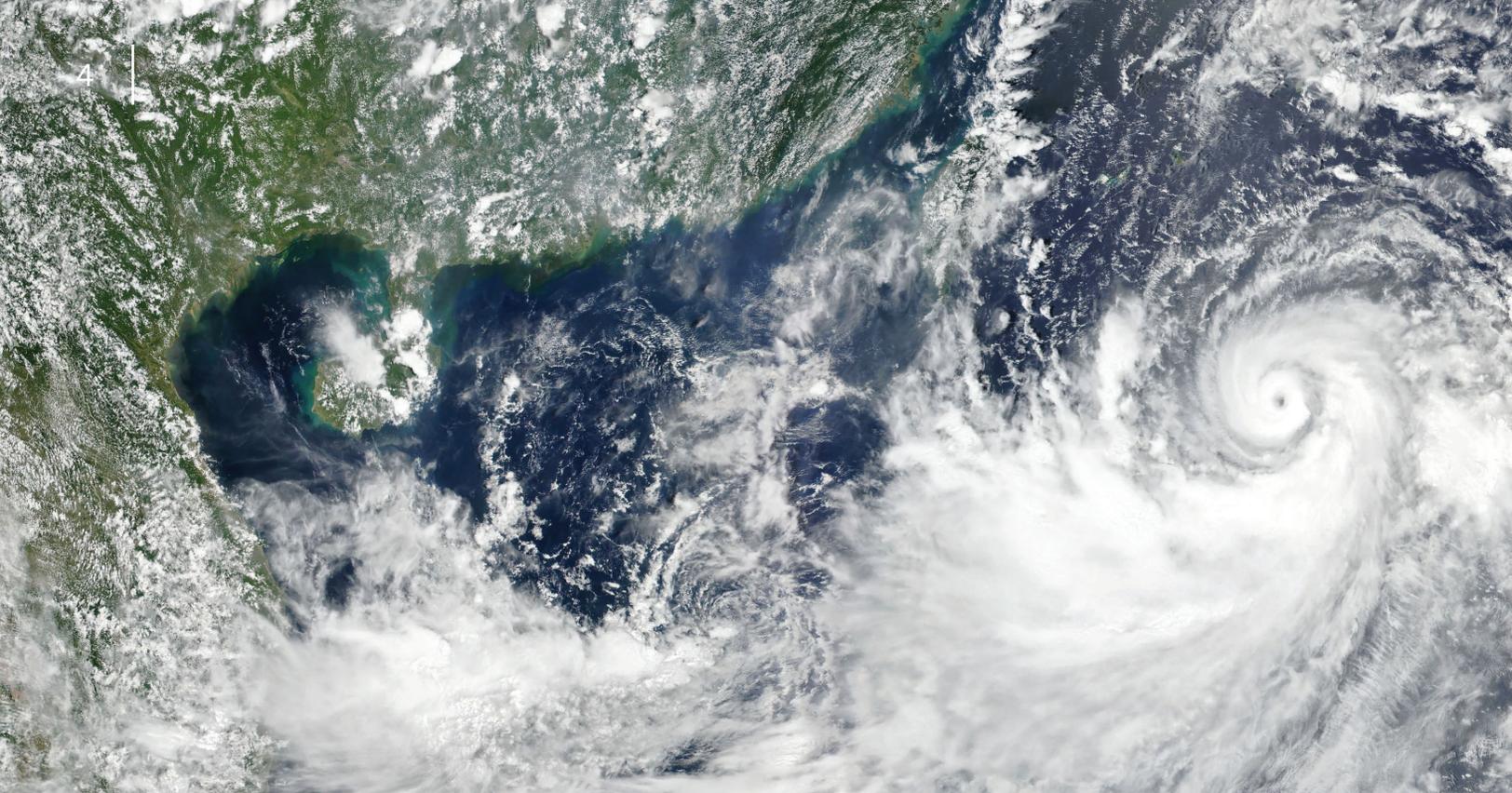
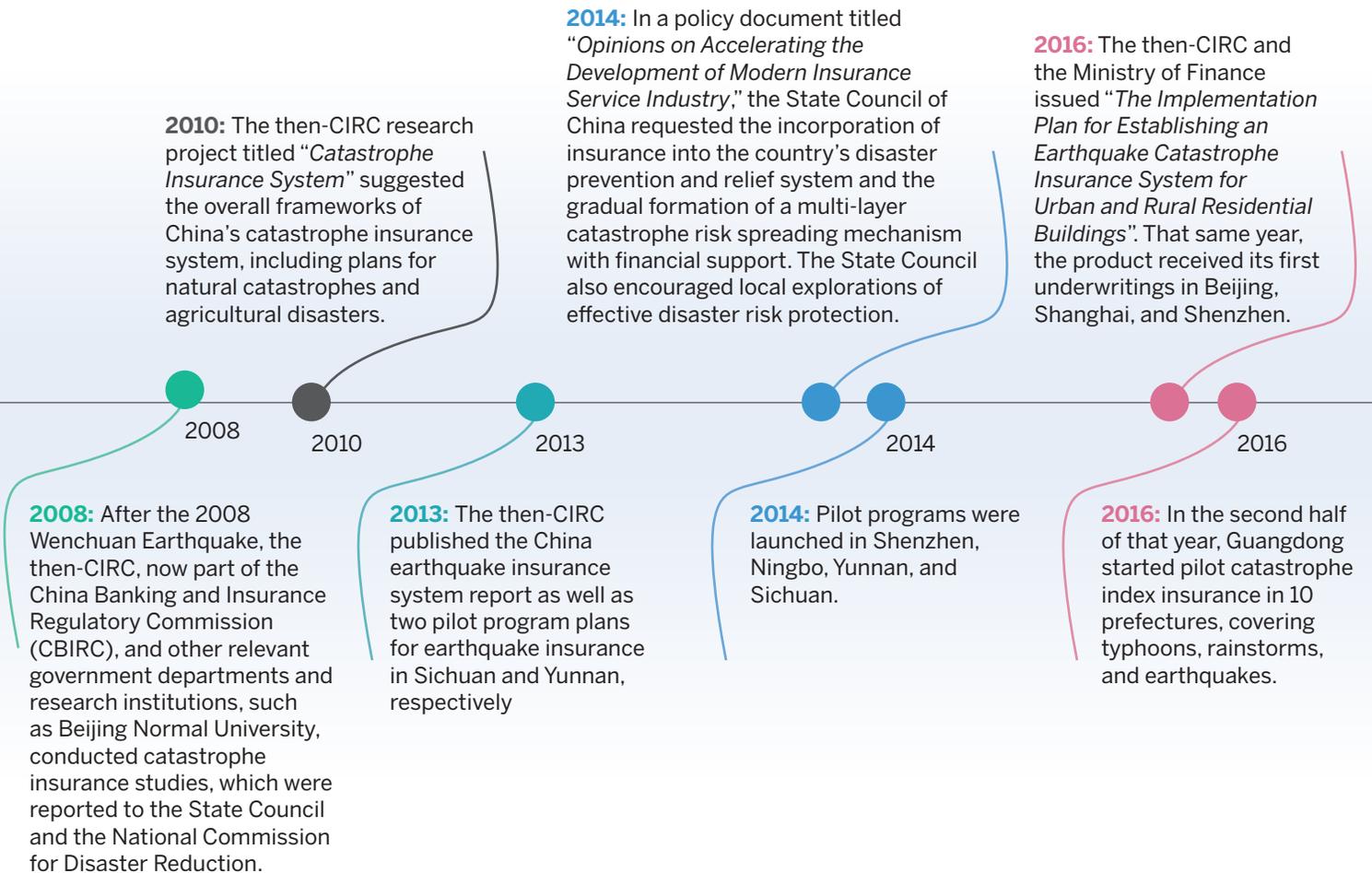
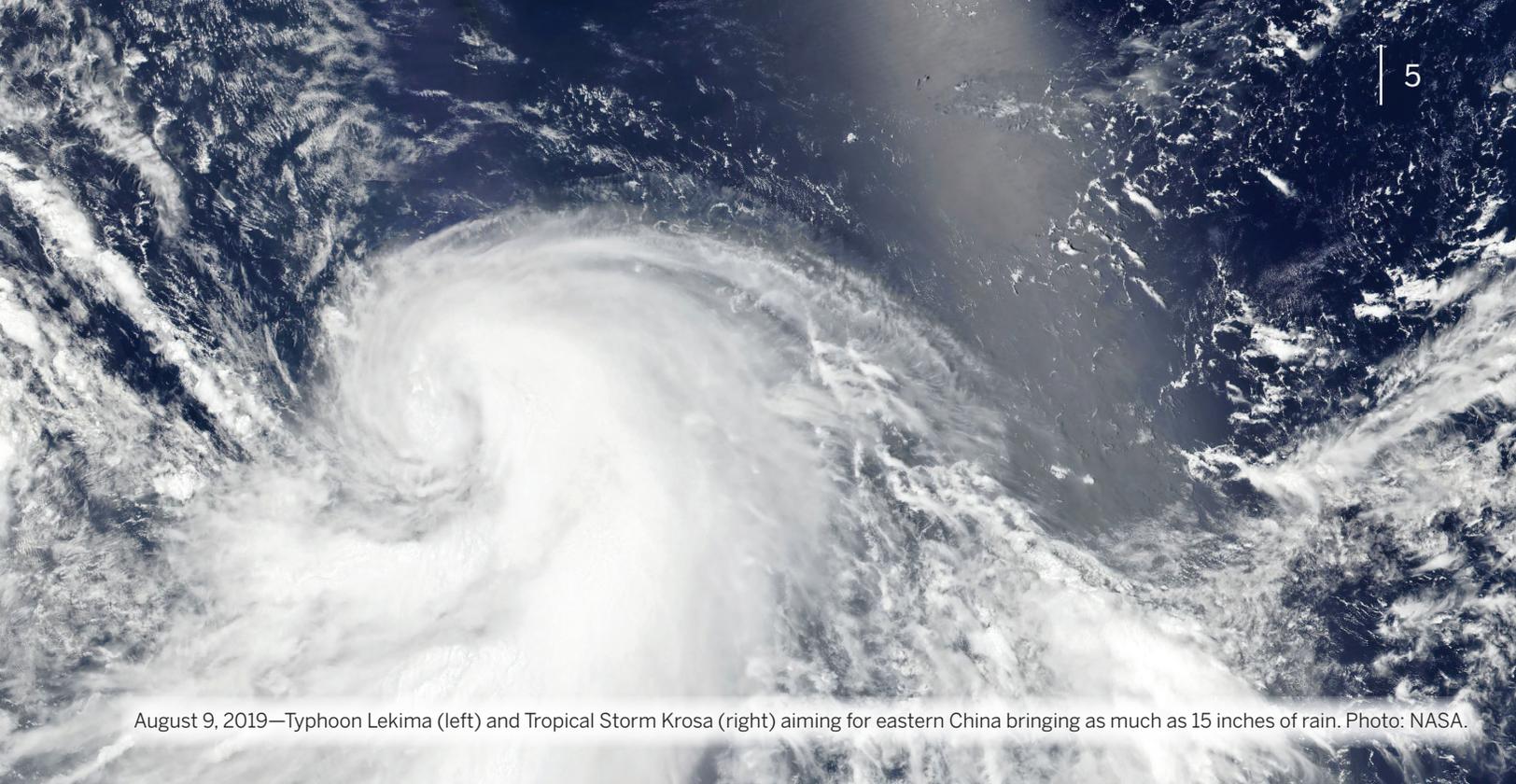


Figure 6.1. The Development of China's Catastrophe Insurance System





August 9, 2019—Typhoon Lekima (left) and Tropical Storm Krosa (right) aiming for eastern China bringing as much as 15 inches of rain. Photo: NASA.

Guangdong—local governments are purchasing insurance on behalf of all the citizens. Insurance indemnity covers many areas that were previously handled by government relief.

China's catastrophe insurance system is still in its pilot stage and there are many challenges ahead. It is worth noting that, despite the progress that has been made in expanding the reach of catastrophe insurance over the past decade, overall coverage is still very limited. Moreover, the pilot areas are mostly in economically developed areas. Most provinces in the central and western regions, as well as most rural areas, still have no coverage. Certain types of insurance—flood insurance and typhoon insurance for example—as well as supporting techniques such as catastrophe risk models, are still underdeveloped.

Indemnity Stories

- **Sichuan.** On September 12, 2018, an earthquake of magnitude 5.3 occurred in Hanzhong City, Shannxi Province, a province neighboring the north of Sichuan. People's Property and Casualty Insurance Company of China (PICC P&C), Guanyuan Branch, paid a total of 25,000 yuan for earthquake house damage.⁵ This was the first indemnity case of the pilot program. On June 17, 2019, a magnitude 6 earthquake hit Changning County, Sichuan Province, claiming the lives of 12 people and causing the relocation of over 4,000 people. In total, more than 10,000 houses were damaged. Two days after the quake, the insurance industry received 65 claims with an estimated total indemnity of 596,100 yuan.⁶
- **Yunnan.** On March 27, 2017, three consecutive earthquakes with magnitudes of 4.7, 5.1, and 4.3 struck Yangbi County, Dali Prefecture. The index-based earthquake insurance was triggered. Indemnity was computed and paid within 32 hours after the quake, for a total amount of 28 million yuan.⁷
- **Ningbo.** Since 2015, Ningbo's program has had six mass indemnities triggered by catastrophes. In August 2019, Super Typhoon Lekima hit

[5] Sina News. <http://news.sina.com.cn/o/2018-11-15/doc-ihnvukff4923490.shtml> (in Chinese).

[6] Sina News. <http://news.sina.com.cn/o/2019-06-19/doc-ihytcerk7959547.shtml> (in Chinese).

[7] YNY DC. <http://www.ynydc.com/webNews/content.do?id=5682> (in Chinese).

nine provinces on China's eastern coast. For the city of Ningbo, total direct economic loss was estimated to be 1.97 billion yuan. By August 12, insurance companies had received reports of more than 53,000 cases with total claims up to 460 million yuan. By August 15, total claims had reached 634 million yuan, and the estimated final indemnity could be over 700 million yuan.⁸

- **Shenzhen.** On April 11, 2019, a rainstorm struck Shenzhen, causing a flash food and claiming nine lives. Shenzhen catastrophe insurance paid a final indemnity of 250,000 yuan for each dead or missing person, and an extra 20,000 yuan for the relocation of family members.⁹
- **Guangdong.** On August 23, 2017, Typhoon Hato landed in Zhuhai. According to the formal report from Guangdong Province's climate center, the wind speed of Hato exceeded the threshold of predefined index for Yangjiang City and Yunfu City; insurance indemnity was triggered. Within half a day,

1.2 million and 10 million yuan were paid to bank accounts specified by Yangjiang and Yunfu city governments respectively.¹⁰ In 2018, Super Typhoon Mangkhut triggered insurance indemnity for Yangjiang and Maoming. Within 24 hours, insurance companies paid 5.5 million and 20 million yuan to the departments of finance of Yangjiang and Maoming cities, according to index calculation, respectively.¹¹

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[8] ZJOL. http://money.zjol.com.cn/bxdt/201908/t20190823_10866566.shtml (in Chinese).

[9] Baidu. <https://baijiahao.baidu.com/s?id=1631235789146363426&wfr=spider&for=pc> (in Chinese).

[10] EPICC. http://www.epicc.com.cn/renbao/zixunzhongxin/meitiguanzhu/201708/t20170830_9829.html (in Chinese).

[11] Sina News. <http://gd.sina.com.cn/finance/observer/2018-09-19/cj-ihkhfqnt0535235.shtml> (in Chinese).



3D Render of Guangzhou City. Relief texture SRTM data courtesy of NASA. Photo: FrankRamspott.

Table 6.1. China's Catastrophe Insurance: National and Local Systems Compared

	National Earthquake Catastrophe Insurance	Sichuan Earthquake Catastrophe Insurance	Government-Supported Earthquake Insurance for Rural Residential House in Yunnan Province	Ningbo (Zhejiang) Catastrophe Insurance	Shenzhen (Guangdong) Catastrophe Insurance	Guangdong Catastrophe Insurance
Perils and triggers	Destructive earthquake vibrations and secondary disasters including tsunami, fire, explosion, subsidence, mudflow, and landslide.	Destructive earthquakes of magnitude 4.7 (and above) and its secondary disasters.	Earthquakes of magnitude 5 (and above) and secondary disasters.	Typhoon, strong tropical storm, tornado, rainstorm, flood, and blizzard and their secondary disasters. Losses of family property (> 2,000 households) or casualties (> 3 people).	15 types of disasters (storm, rainstorm, cliff collapse, lightning, flood, tornado, squall line, typhoon, tsunami, mudflow, landslide, sinkhole, hail, waterlogging, earthquakes of magnitude 4.5 (and above) and their secondary disasters.	Typhoon and flood (heavy rainfall). Typhoon: Typhoon track enters the predefined spatial extent and reaches the threshold (the 2-minute average speed of the maximum wind near the eye reads 32.6 m/s, force 12). Heavy rainfall: Heavy rainfall events occur in the insured area, and the maximum rainfall of any effective observation station reaches the disaster threshold.
Sum insured	Urban residential houses: 50,000 ~ 1,000,000 yuan per household. Rural residential houses: 20,000 ~ 1,000,000 yuan per household. Given that this segment of insurance industry is still nascent, the initial insurance amount will not exceed 1 million yuan, and will be gradually improved according to the operation situation. The part that is greater than 1 million yuan can be supplemented by commercial insurance.	From 50,000 yuan for urban housing and 20,000 yuan for rural housing, with upper limits of 1 million yuan per household. The upper limit of an annual aggregate payment is either 8 times the premium revenue, or 800 million yuan. If the annual total insurance loss exceeds the sum of the limit and insurance reserve fund, the policy callback is proportional.	Rural house loss: 420 million yuan/a in total. Resident death: 100,000 yuan/person, 80 million yuan/a.	Casualty benefits: 200,000 yuan/person, 300 million yuan/accident. Family property: 3,000 yuan/household, 300 million yuan/accident. Public event relocation: 13,500 yuan/person.	Casualty benefits: 100,000 yuan/person, 2 billion yuan/accident. Nuclear emergency relief: 2,500 yuan/person, 500 million yuan/accident. House loss: 20,000 yuan/household, 200 million yuan/accident. Indemnity limits apply only to events. No annual upper limits.	Indemnity limits are determined by the local financial budget. For the procurement bidding of 2017–2020, typhoon insurance has an upper limit of 1.07 billion yuan and heavy rain insurance has an upper limit of 1.09 billion yuan in 10 prefectures.
Loss-adjustment	Indemnity-based. Damages classified into 5 levels according to the national standards formulated by the China Earthquake Administration and the Ministry of Civil Affairs. Level I and II (slight damage), no indemnity. Level III (medium damage), 50% of the sum insured. Level IV (severe damage) and level V (total collapse): 100% of the sum insured.	Indemnity-based. Classified into 5 levels of damage according to the <i>National Standard Classification of Earthquake Damage Level of Buildings (Architecture)</i> . Similar to the national standard policy.	Index-based and indemnity-based. Indemnity for housing is decided by the earthquake magnitude, as long as the epicenter is within specific location (in Dali Prefecture or in the surrounding area). Mortality is indemnified according to the actual number of deaths.	Indemnity-based. Casualty: Follows <i>Life-Insurance Disability Evaluation Standard</i> . Family property damage relief: Depends on the depth of water logging or actual damage.	Indemnity-based. Casualty benefits: Refer to <i>Life-Insurance Disability Evaluation Standard</i> .	Index-based. After the occurrence of the disaster event, the index calculation institution shall compute the disaster index and issue a report according to the typhoon or rainfall data. After confirmation by the government and insurance companies, the insurance company shall indemnify according to a pre-defined structure.

Table 6.1. Cont.

	National Earthquake Catastrophe Insurance	Sichuan Earthquake Catastrophe Insurance	Government-Supported Earthquake Residential House in Yunnan Province	Ningbo (Zhejiang) Catastrophe Insurance	Shenzhen (Guangdong) Catastrophe Insurance	Guangdong Catastrophe Insurance
Underwriting	Voluntary participation.	Voluntary participation.	Whole participation of Dali Prefecture.	Whole participation for the first year. Encourage voluntary participation.	Whole participation handled by the Bureau of Civil Affairs of Shenzhen.	The provincial government buys service for prefecture governments through open bidding.
Premiums and rates	Using risk-based premium rates according to the regional risk level, building structure, urban and rural differences.	Set 4 levels of premium rates according to earthquake risk and building structure and rural and urban difference.	Premium rate of 2016 is 6.43%	Casualty: 4.17%. Family property damage relief: 8.33%.	Unknown.	Total premium for year 2017 is 123.8 million yuan.
Premium payment	Policyholders pay the premium, but premium subsidy is encouraged.	Policyholders pay 40% of the premium, and government provides 60% premium subsidy. 100% premium subsidy is applicable for households needing special assistance.	Fully paid by the Dali Prefecture government.	Fully paid by the government. Municipal and county (district) finance cover 60% and 40% of the cost, respectively.	Fully paid by the Shenzhen government.	Fully paid by the government.
Reserve fund	A portion of the premium revenue will be used to set up a special reserve fund, which rolls over in an independent account year by year. The extraction, accumulation, and use of the fund is subject to specific management measures defined by the financial department.	Premium surplus (total revenue subtracting the cost of reinsurance, indemnities, operating expenses, and predefined profits) will be fully put into the a reserve fund. The contractor shall set up separate account for the reserve fund. The fund is subject to independent accounting.	If no claims, 70% of annual revenue will be reserved or 60% of premium surplus will be reserved. The predefined profit rate is 6% after tax. The fund shall be put in an independent account, subject to independent accounting, and roll over year by year.	Premium surplus will be fully reserved. Besides, Ningbo municipal government arranges another 10.2 million yuan each year to support the reserve fund. The fund shall be supervised and managed by the relevant departments designated by the Ningbo municipal government. Insurers can apply for funding when simple loss ratio exceeds 125%, and the funding is up to the total fund available in the reserve.	Unknown.	Unknown.
Catastrophe risk sharing	In the initial stage of operation, the general idea is total control and quota management. On one hand, define the upper limit of a single earthquake so that the loss can be shared by layers of insurer, reinsurer, and reserve fund. On the other hand, define insurance sales quota in high-risk areas of earthquakes.	Multi-layer risk-sharing mechanism of insurance-reinsurance-reserve fund-government contingent fund.	Multi-player pooling by involving approximately 2–3 insurance and reinsurance companies.	Multi-layer risk-sharing: (1) Total indemnity ≤ 300 million, paid by insurance company. (2) Total indemnity exceeding 300 million yuan, paid by the reserve fund, up to the maximum fund raised. (3) Residents are encouraged to purchase commercial catastrophe coverage on their own.	Multi-layer risk-sharing: (1) Insurance. (2) Reserve fund. To cover the cost of casualty assistance and nuclear emergency relocation that is beyond the limit of insurance. (3) Personal catastrophe insurance, which residents should purchase independently.	Not specified.

Table 6.1. Cont.

	National Earthquake Catastrophe Insurance	Sichuan Earthquake Catastrophe Insurance	Government-Supported Earthquake Insurance for Rural Residential House in Yunnan Province	Ningbo (Zhejiang) Catastrophe Insurance	Shenzhen (Guangdong) Catastrophe Insurance	Guangdong Catastrophe Insurance
Impact	In 2018, premium revenue reached 124 million yuan, providing risk protection of 159.9 billion yuan. In total, risk protection of 266.5 billion yuan was provided, and 5.33 million yuan has been indemnified to 10.08 million households since implementation.	By the first quarter of 2018, 18 cities (states) in Sichuan Province have joined in the earthquake catastrophe insurance program. It has benefited 1.65 million urban and rural residents and provided total risk protection of 43.1 billion yuan.	During 2015–2019, the program collected in total 140 million yuan in insurance premiums, and the corresponding protection reached 1.186 billion yuan. In 2015–2018, there were four earthquakes of magnitude 5 or above, and in total 69.69 million yuan was indemnified, taking 11.4% of the total residential loss. The payment was as quick as 32 hours after the quake.	From 2015 to 2018, the program paid 193.3 million yuan to more than 333,000 households affected by disasters.		In 2016, the program provided 2.347 billion yuan of risk protection. In 2016–2017, the program paid indemnity of 89 million yuan to 10 cities. In 2017–2018, 14 cities paid 185 million yuan in premiums and received 493 million yuan of indemnity.

Note: Data about the national standard program, the Sichuan program, the Ningbo program, and the Shenzhen program are provided by People's Property and Casualty Insurance Company of China. Data about the Yunnan program was provided by the Yunnan earthquake risk management innovation laboratory and Champion Property & Casualty Insurance Co., Ltd. Data about the Guangdong program was provided by the Guangdong Meteorological Administration.