

AN ANALYSIS OF FIRES IN CHINA IN 1980s

Qian Jihu

Associate Professor, Shanghai Fire Research Institute

Zhang Ping

Engineer, Fire department, Shanghai Railway Public Security Bureau

Qiang Fulin

Senior engineer, China Petrochemicals East China Co.

In the 1980s, when reform and opening was in full steam in China, the Chinese economy developed smoothly and soundly. Its GNP grew at the high rate of 9% on annual basis, drawing much world attention. Alongside the rapid growth of the national economy and the expansion of the cities and population, however, there was also a marked increase of serious fire incidents. Particularly there were a series of exceptionally large fires. These caused severe casualties and damages, rousing great concern of the governments at all levels and the social communities.

1. THE MAIN TENDENCIES OF THE FIRES IN CHINA IN THE 1980S

In the decade from 1981 to 1990 there were in China altogether 378,857 fires, with casualties of 22,758 dead and 35,053 injured, and economic loss of 3,547 million yuan. In average, there were annually 37,885 fires, with casualties of 2,275 dead and 3,503 injured, and economic loss 354 million yuan. The average number of fires daily was 104, and the average economic loss in one fire was around 9,000 yuan.

In the decade, the year 1981 had the highest fire incidence, with 50,034 fires. The fire incidence in 1982 was lower than that in the previous year by 9%, with 41,541 fires. From 1983 to 1987, the fire incidences were continually lower, with between 32,000 and 28,000 fires yearly. In 1988 and 1989, the fire incidences fell further by 6.8% and 19%, with 29,852 fires and 24,154 fires. The incidence of fire in 1990 seemingly multiplied, but that was for some special reasons. The new Fire Statistics Regulations were in effect since January, 1990. According to the new regulations, fires (inflicting a collective economic loss

below 100 yuan, a personal loss below 50 yuan and no severe injuries to any person) which were formerly counted only as fire alarms were now counted as fires. In addition, the fire statistics now included fires in military grounds and in underground mines.

Table 1. Fires in China between 1981 and 1990

year	No. of fires	persons killed in fire	persons injured in fire	Eco. loss (10,000 yuan)
1981	50034	2643	3480	23130
1982	41541	2249	2920	18926
1983	37026	2161	2741	20397
1984	33618	2085	2690	16086
1985	34996	2241	3543	28421
1986	38766	2691	4344	32584
1987	32053	2411	4009	80560
1988	29852	2234	3206	35424
1989	24154	1838	3195	49125
1990	56817	2083	4898	50098
Total	378857	22758	35035	354251

NOTE:

The statistics in the above do not include state forest fires from 1981 to 1990 and fires in underground mines and military grounds from 1981 to 1990. (The same applies to the other tables in the article.)

Throughout the decade the annual fire fatality rate in China remained stable. The year of 1986 and the year of 1981 had the highest and the next highest fire fatality rates, with respectively 2,691 and 2,643 deaths. The year of 1989 had the lowest fire fatality rate, with 1,838 deaths, only one-fifth of that of 1960.

As afore mentioned, although in the 1980s China experienced a great economic growth and the Chinese people enjoyed a higher living standard, the country had a greater economic loss in fires. In the first four years of the decade, the annual economic loss in fires in China stayed between 160 million yuan and 231 million yuan, but in 1985 and 1986 the annual fire losses rose by 76.7% and 13.8% over the previous year respectively. In 1987 there was the exceptionally large forest conflagration in the Daxinganling region, and the economic loss in fires that year rose by 147% to 800 million yuan. In 1988 such loss fell back to 354 million yuan, but rose again in 1989 by 38.4% to 490 million yuan. In 1990 such loss was about the same as in the previous year, at 501 million yuan.

From the above figures it can be seen that the increase of economic loss in fires took place in the six years in the latter part of the 1980s when the Chinese economy was steaming ahead and the country had more resources at its disposal to prevent and fight fires. The apparent anomaly points to the need for speeding up the fire service in keeping with the fast economic development. The more developed is the production force in a society, the more urgent it is to enhance its fire service.

2. AN ANALYSIS OF FIRES IN THE 1980S

For the Chinese fire service, reform and opening has brought along new measures and new perspectives. The fire departments in various parts of China have cooperated closely with the community and increased their efforts, thus achieving better results. By comparing the statistics of fires in China in the 1980s with that of the past and the other countries (vertical and lateral comparisons) we can see clearly that both the fire incidence and the loss in the fires in this period were relatively modest.

Table 2. Fires in China in 1970s and 1980s

Decades	fire numbers	fire deaths	persons (injured)	Eco. loss in fires (unit: 10,000yuan)
1970s	686812	42858	81643	240566
1980s	378857	22758	35035	354751
up/down	-44.8%	-46.8%	-57.8%	+47.4%

In the 1980s, the average increase in the Chinese population and GNP was 1.2% and 9% annually. But in this decade the fire incidence and the number of people died and injured in fire were all less than in the previous decade of the 1970s, by 44.8%, 46.8% and 57.8% respectively, which was a very unusual achievement. When the factors of population, maintenance and inflation are taken into consideration, the economic loss in fires, in this decade, too, was less than in the previous one. According to the data in the China Statistics Yearbook, the cost of house construction in 1988 (301 yuan per sq.m.) was 2.89 times that in 1978 (104 yuan per sq.m.). Adjusted accordingly, the total economic loss in fires of 3,547 million yuan in the 1980s was only equal to 1,220 million yuan at the 1978 currency value. Compare this with the total economic loss in fires of 2,400 million yuan in the 1970s and we can see that the economic loss in fires in the 1980s was lower by 48.9% than that in the 1970s in real terms.

We may need to point out that the heavy fire loss in the 1970s provides a sharp contrast to the relatively moderate fire loss in the 1980s. One reason for the high fire loss in the

1970s is that the first half of that decade was at the height of the cultural revolution; fire loss in these years constituted 53% of the total fire loss in the 1970s. A second reason is that in the latter half of the 1970s the fire service was in the process of recovery; the State Fire Service Bureau was reestablished only in 1978.

Similarly, even with the forest conflagration in the Daxinganling region in 1987, the total forest fire loss in the 1980s was still lower than in the 1970s. The forest fire incidence fell by 12%, from 147,500 fires in the 1970s to 119,900 fires in the 1980s. The loss of timber resources through fire fell from 323.96 million cu.m. in the 1970s to 77.69 million cu.m. in the 1980s. Based on the 1987 currency value, direct economic loss in forest fires fell by 76%, from 48,590 million yuan in the 1970s to 11,650 million yuan in the 1980s.

For a lateral comparison we select 1987, a year with the biggest fire loss in China in the 1980s. Table 3 compares the fire loss in China in this year with the fire loss in seven other countries in the same year.

Table 3. Fires in a number of countries in 1987

Country	fire numbers	No. of fires per 10,000 persons	fire deaths	No. of deaths per 1000,000 persons	Economic loss (unit: 10,000 yuan)	Proportion in GNP %
China	32,053	0.3	2411	2.3	0.077	
Japan	58,833	4.8	1857	15.3	0.042	
Britain	353,996	62.2	929	16.3	0.132	
Italy	131,656	23.0	173	3.0	0.069	
USA	230,000	95.7	5863	2.5	0.19	
Norway	12,592	30.0	65	15.5		
Australia	22,616	29.5	102	14.6	0.11	
New Zealand	19,375	50.7	37	10.9		

We can see from the above table China ranks the lowest in the number of fires per 10,000 persons, the number of deaths per 1 million persons and the average loss in each fire.

3.CERTAIN SERIOUS ASPECTS OF THE FIRES IN THE 1980S

In the 1980s there were in China a number of large fires, some of which were of a nature that was unprecedented. In particular there was a sharp increase in the number of exceptionally large fires, i.e., fires that caused loss exceeding 10 million yuan. Statistics show in the 1960s there was only one exceptionally large fire. In the 1970s there were

three such fires. In the 1980s the number of such fires multiplied to 15, causing a total economic loss of more than 800 million yuan, taking up one-fifth of the economic loss of all the fires in the decade. Some of these exceptionally large fires shocked the Government and the entire community of the country, evoking enormous reaction. In the main, such fires might be broken down into the following categories:

(1) Exceptionally large ship fires

In the 1980s there were five ship fires, with 30 deaths and economic loss of 130 million yuan. In the fires, two cargo ships and two tankers sank with all their cargos and one oceanographic ship was badly wrecked.

(2) Fires in which town residents suffered heavy loss

Between 1985 and 1986, the residents in the city of Ichun were hit by two exceptionally large fires in less than one year. In the two fires, the fire scenes covered 516,000 sq.m., 2,750 houses caught fire and the total economic loss reached 35 million yuan.

The exceptionally large forest fire of Daxinganling in 1987 spread to several cities. In the fire one county and three townships were destroyed and 193 residents died, and buildings with a total floor space of 610,000 sq.m. were burnt down. The total economic loss reached 526 million yuan. Altogether more than 50,000 city residents suffered fire casualties and/or damages. The fire created a record of loss in a single fire.

(3) Disastrous Petroleum fires

In January, 1989, a petroleum barge on the Yangtze River near Wuhan caught fire and in August the same year an oil depot at Huangdao was on fire. Both fires continued for several days and nights, making a terrible scene. In putting down the fires 22 firemen and armed police sacrificed their lives. The direct loss in the two fires reached more than 40 million yuan. The official statistics showed the economic loss of the Huangdao petroleum fire was 34.5 million yuan, but some journalists put it at 100 million yuan.

(4) Warehouse fire with great loss

In 1985, the warehouse of the Third Cotton Processing Factory at Heze in Shandong province caught fire and lost 22.19 million yuan through fire damage.

(5) Exceptionally large fire caused by arson

In 1989, some ruffians set fire to the People's Emporium in Chengdu of Sichuan province. The conflagration resulted in economic loss of more than 70 million yuan.

There were other large fires in the 1980s that drew the public concern. Although these fires inflicted economic loss of less than 10 million yuan each, they occurred in high rises, large department stores, large passenger planes and underground architectures. Serious attention should be given to such fires, as such fires were very scarce in the three decades

preceeding 1980. The following are a few instances of such fires: In 1982 a civil aviation plane caught fire in flight, incurring 24 deaths and injuries to 27 persons among its Chinese and foreign passengers, plus a direct economic loss of 1.98 million yuan. It was the first civil aviation fire incident since the founding of the People's Republic of China. In 1985 a fire broke out in the White Swan Hotel in Harbin. Ten people (including six foreign guests at the hotel) died in the fire. In the same year in Gansu province, a historic religious edifice that could accommodate 4,000 prayers at one time was on fire. The edifice and the greater part of the cultural treasures contained in it were destroyed. In 1988, a large fire destroyed an underground emposium in Nanchang in Jiangxi province. In 1990 a fire broke out in a railway tunnel across the Daba Mountain in Sichuan province (disrupting the railway traffic for 12 days). Fires of the kinds mentioned above that were rarely seen in China in the past will be more frequent as the economy of the country grows further. Due precautions, therefore, must be taken against them.

5.COMPARISON OF FIRES IN THE DIFFERENT REGIONS IN CHINA

The table below shows the ratios of the average annual fire incidence and loss in the six regions of China in the ten years from 1981 to 1990:

Table 4.

Region	No. of fires per 100,000 persons	fire deaths per 1 million persons	Ratio of Eco. loss in fires (yuan/person/year)
Northeast	4.08	3.52	0.97
North China	2.74	1.5	0.24
East China	2.86	2.11	0.26
Central South	2.26	1.94	0.24
Southwest	4.51	2.97	0.27
Northwest	3.82	1.94	0.29

The above table shows in the six regions in China the Southwest (Sichuan, Guizhou, Yunnan and Xizang), the Northeast (Heilongjiang, Jilin and Liaoning) and the Northwest (Shanxi, Gansu, Ningxia and Xinjiang) had the three highest fire incidence ratios of 4.51,4.08 and 3.82 fires per 100,000 persons per year respectively. The Central South (Henan, Hubei, Hunan, Guangdong, Guangxi and Hainan) had the lowest fire incidence ratio of 2.26 fires per 100,000 persons per year.

The Northeast had the highest fire fatality ratio of 3.5 deaths per 1 million persons per

year. The Southwest comes second, with a fire fatality ratio of 2.47 deaths per 1 million persons per year. North China (Beijing, Tianjin, Hebei, Shanxi and Inner Mongolia) had the lowest fire fatality ratio of 1.5 deaths per 1 million persons per year.

The Northeast also had the highest fire damage rate of 0.97 yuan per person per year, followed by the Northwest and the Southwest, with fire damage rates of 0.29 yuan and 0.27 yuan per person per year respectively. North China and the Central South both had the lowest fire damage rate of 0.24 yuan per person per year.

Incidentally, a preliminary survey of the fires in the provinces and municipalities in China shows that the provinces which suffered high fire damages in the 1980s are, in order of the values of the damages, Helongjiang (710 million yuan), Guangdong (250 million yuan), Sichuan (240 million yuan), Zhejiang (230 million yuan) and Shandong (160 million yuan). Beside Helongjiang, which had the exceptionally large forest fire, and Sichuan, which had the largest local population, the coastal provinces and municipalities incurred a large proportion of the fire loss in China during this period. The coastal areas, where the policies of reform and opening were in effect earlier and the economy was more advanced, obviously had a stronger upward trend of fires and fire damages. In 1989 the value of fire damages in Guangdong province was six times that in 1979. In the same period the values of fire damages in Fuzhou and Quanzhou municipalities both rose sixteen times. These were convincing examples of this upward trend.