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China's year of the rabbit inherits the tiger's drought and frost

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Beijing celebrated the official end of the spring festival at full moon with city-wide fireworks on 17 February. In Chinese astrology the rabbit year started on 3 February and stands for harmonious and quiet months to come. It has succeeded the year of the fearless but fiery Tiger. Many people in China and the Northern provinces in particular will remember the Tiger Year as a dry Tiger, putting the environment and society under extreme, long-lasting water stress. Unfortunately, the Rabbit has inherited the Tigers drought and the frost which are China's severe climate and weather risks during this year's spring festival period.



Acrobats perform outside a Daoist temple during a temple fair in Beijing, China, 06 February 2011. Chinese people are celebrating the lunar year of the Rabbit which began on 03 February 2011 | photo credit: EPA/DIEGO AZUBEL

Frost in Central and South China has disrupted the beginning of the annual Spring Festival travel rush, with temperatures reaching their lowest since 1961 in Guizhou, Hunan and Hubei provinces. Spring Festival is the most important Chinese festival for family reunion. People return to their homes, often thousands of kilometres away from work or study, to have a reunion dinner with families on the New Year's Eve. Its importance can be compared with Christmas break in Europe or Thanksgiving in the US. The only difference: it is often the only paid leave for workers throughout the year and the travel season, or Chunyun (spring transportation), is an annual test on China's transportation systems with 300 million passengers who spend several days in overcrowded buses or trains.

Fortunately, this year's travel season has not been hit as badly as in 2008 when millions of passengers got stuck in railways, buses, or stations for several weeks during an extreme snow and frost disaster.

Several frost warnings have been published by the China Meteorological Administration this year for large parts of Central and South China. In January, freezing rain has swept south China's Guizhou Province, Hunan Province and Guangxi Zhuang Autonomous Region.

Beijing's 20 million inhabitants will remember historical period of no rain. The capital city did not receive any rainfall in nearly four months. Since last October, North China and the Yellow-Huaihe River valley have seen continuously less rainfall up to 90% below average which led to drought in China's eight important winter growing areas in Shandong, Henan, Hebei, Shanxi, Anhui and Jiangsu, Shaanxi and Gansu and left some 7 million hectares or farmland short of water supply. East China's Shandong Province, one of the country's major grain producers, recorded the worst drought in 200 years. Large-scale drought relief works have started when the meteorological drought became an agricultural drought this year months ago. China's central and local governments have supported the irrigation of more than 1 million hectares of winter wheat farmland by digging more than 10,000 wells and carrying 360,000 cubic meters of water.

The reason for the long-lasting drought can be found in the above-normal strength of the cold air which affects China during winter (the winter monsoon) and below-normal moisture conditions from the South, in brief by anomalous Arctic Oscillation and La Niña. In January, the atmospheric circulation in the middle (Central China) and high (North China) latitude areas of the northern hemisphere produced the typical winter monsoon cold and dry airflow from

North to South. La Niña, the phenomenon describing cold ocean surface temperatures in the South Pacific, caused that the subtropical high in the Northwest Pacific Ocean was weaker than it is usually in January. Less moisture entered the atmosphere over China from the Pacific Ocean and the moisture from the Bay of Bengal was blocked by the strong cold air flow instead of reaching areas North of the Yangtze River which would be usual this time a year.

Since February, the atmospheric circulations in middle and high latitude areas have adjusted. The Arctic Oscillation turned to a positive phase and weakened the northern cold air. The moisture from the Bay of Bengal entered China which resulted in two rounds of snowfall between 9 and 13 of February. They have brought some short relief for the drought-hit areas of Beijing, Tianjin, Hebei, Shanxi, Shandong, Henan, Anhui, and Jiangsu. The area that suffered from severe drought has decreased. Although some light rainfall is predicted for next week, irrigation is further required to avoid larger damages to the winter crops.

China's climate is controlled by the winter and summer monsoon and the country hosts the basins of the third and fifth longest rivers in the world, the Yangtze and the Huanghe. Drought, flood and other climate or weather extremes have always belonged to China and have been reconstructed by quaternary scientists for thousands of years and even historically documented for the last two thousand years by the imperial bureaucracy. However, in the last Tiger Year, 2010 in Western analogy, China suffered the most severe weather-climate events in decades. Severe high temperature and severe rainfall happened in higher frequency, higher intensity and in larger scope. Different from historical records they happened more simultaneously. In autumn, only half of the average number of Tropical Cyclones has developed in the West North Pacific, but the double number has made landfall on mainland China. Extreme weather last year caused more than 4,800 casualties and resulted in direct economic losses of more than 500 billion yuan (€56 billion).

Climate change is projected to increase the frequency and intensity of climate and weather-related hazards in China, imposing more risks to a society that has been emerging on its path to sustainable development. Many people hope that the weather conditions develop to what the Year of the Rabbit is supposed to bring: harmony, quiet and balance.

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