

# China's wars, rebellions driven by climate: study

July 14 2010, by Marlowe Hood

---



A woman sweeps snow off the steps of a temple in Beijing. Two millennia of foreign invasions and internal wars in China were driven more by cooling climate than by feudalism, class struggle or bad government, a bold study released Wednesday argued.

Two millennia of foreign invasions and internal wars in China were driven more by cooling climate than by feudalism, class struggle or bad government, a bold study released Wednesday argued.

Food shortages severe enough to spark civil turmoil or force hordes of starving nomads to swoop down from the Mongolian steppes were consistently linked to long periods of colder weather, the study found.

In contrast, the Central Kingdom's periods of stability and prosperity occurred during sustained warm spells, the researchers said.

Theories that weather-related calamities such as [drought](#), floods and locust plagues steered the unravelling or creation of Chinese dynasties are not new.

But until now, no one had systematically scanned the long sweep of China's tumultuous history to see exactly how climate and Chinese society might be intertwined.

Chinese and European scientists led by Zhibin Zhang of the Chinese Academy of Sciences in Beijing decided to compare two sets of data over 1,900 years.

Digging into historical archives, they looked at the frequency of war, price hikes of rice, locust plagues, droughts and floods. For conflict, they distinguished between internal strife and external wars.

At the same time, they reconstructed climate patterns over the period under review.

"The collapses of the agricultural dynasties of the Han (25-220), Tang (618-907), Northern Song (960-1125), Southern Song (1127-1279) and Ming (1368-1644) are closely associated with low temperature or the rapid decline in temperature," they conclude.

A shortage of food would have weakened these dynasties, and pushed nomads in the north -- even more vulnerable to dips in temperature -- to invade their southern, Chinese-speaking neighbours, the authors argued.

A drop of 2.0 degrees Celsius (3.6 degrees Fahrenheit) in average annual air temperature can shorten the growing season for steppe grasses, which

are critical for livestock, by up to 40 days.

"When the climate worsens beyond what the available technology and economic system can compensate for, people are forced to move or starve," they said.

The study found more droughts and floods during cold periods, but the factors that contributed most directly to wars and dynastic breakup were soaring rice prices and locust infestations.

The Roman and Mayan empires, they noted, also fell during cold periods.

Zhang and colleagues speculated that periodic temperature shifts roughly every 160 or 320 years were related to natural climate changes, namely fluctuations in solar activity and in Earth's orbit and axial spin.

The team said the findings demonstrate that climate change can lead to unrest and warfare.

"Historians commonly attribute dynastic transitions or cycles to the quality of government and class struggles," according to the paper, published in the British journal *Proceedings of the Royal Society B*.

"However, climatic fluctuation may be a significant factor interacting with social structures in affecting the rise and fall of cultures and dynasties."

But the historical evidence they found points to global cooling, not to global warming, as the culprit.

The scientists were cautious about making projections for the future. In 2007, the UN's Intergovernmental Panel on Climate Change (IPCC) said

that man-made warming this century will lead to worse droughts, floods, harsh storms and sea level rise, with the potential to inflict hunger and misery on millions.

(c) 2010 AFP

Citation: China's wars, rebellions driven by climate: study (2010, July 14) retrieved 20 March 2024 from <https://phys.org/news/2010-07-china-wars-rebellions-driven-climate.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.