Paper ID	002
Author(s)	Yu-Chien Jen
Title	Further Investigations on the Famine in Yunnan Province, China from 1815 to 1817: Factors Other Than Climatic Issues

Abstract

This paper investigates factors other than climatic issues that caused adverse weather during the eruption of Mount Tambora in Indonesia in 1815 to affect harvest conditions in Yunnan Province, China. A thorough analysis of primary sources and second-hand data was conducted to demonstrate the findings.

The analysis reveals several key findings. First, it suggests a long-term institutional inefficiency of local governmental authorities, which failed to make the agricultural sector resilient to sudden climatic shocks. Moreover, local chronicles indicate that the authorities only emphasized the collection of heavy taxes from farmers by imposing strict law enforcement.

Second, the agricultural sector had low-quality factor endowments. The area relied on an outdated irrigation system, necessitating intensive labor participation. Lastly, no evidence suggests that the grain varieties and soil could become resilient to low temperatures, further deteriorating the impact of adverse weather conditions.

Regarding other areas of China encountering the same climatic shocks, despite not possessing with advantageous harvest conditions, the beneficial factor endowments sustained the agricultural production.

This paper concludes that when the agricultural sector possesses low-quality institutions and factor endowments, adverse weather will cause severe harvest failures and famine following climatic shocks.

Keywords	China, Mount Tambora, adverse weather, resilience, institution, factor endowments

Paper ID	076
Author(s)	Richard Michael Warren
Title	From Fire to Famine? The impact on India of the 1831 and 1835 volcanic eruptions

Abstract

1831 and 1835. Multiple massive eruptions send vast plumes of sulphur into the atmosphere, forming a layer of aerosols that reaches around the globe. In the following years, terrible famines visit vast tracts of India, leading to reported deaths of over a million people. Just a coincidence? Combining historical accounts with the latest climate reanalysis data, we can attempt to identify the contribution of volcanic activity to these famines. We will see how teleconnections between volcanic eruptions and Indian temperatures may have triggered significant monsoon failures in 1832/33 and 1836/37, but also how this effect was modulated and amplified by the El Niño Southern Oscillation and other climate factors. We will then chart the progress of the subsequent famines through the British and Indian historical sources, seeing how over-taxation and environmental decline produced feedbacks that left the populace especially vulnerable to climatic shocks. When the droughts came, the policies of the ruling East India Company then combined with colonial attitudes and the ideals free market economics to turn the monsoon failures into a humanitarian disaster.

Keywords	Humans, Disasters, India, Monsoon, Volcanic Eruptions

Paper ID	117
Author(s)	Maofeng He and Fengxian Bu
Title	Evolution of Epidemic Prevention Strategies and Ideological Changes during the Han to Tang

	Dynasties, China

Abstract

This study systematically reviews the occurrence characteristics, prevention strategies, and ideological evolution of epidemic disasters during the Han to Tang dynasties, covering three historical stages: the Han, Wei-Jin Southern and Northern Dynasties, and Sui-Tang periods. By analyzing records of epidemics from official histories and other historical documents, the study reveals that the occurrence of epidemics was influenced by both natural and social factors, including natural disasters (such as droughts, floods, and earthquakes) and social turmoil (such as wars, famines, and population movements). First, the frequent outbreaks of epidemics during the Han period were closely related to climate change and social unrest, with wars and natural disasters alternately driving the widespread transmission of diseases. Second, during the Wei-Jin Southern and Northern Dynasties, the extreme disorder in social order and large-scale migration contributed significantly to the spread of epidemics, while the high incidence of epidemics in the Southern and Northern Dynasties was driven by both warfare and migration pressures. Third, in the Sui-Tang period, the relatively stable society led to a decrease in epidemic frequency, though major unrest such as the An-Shi Rebellion still triggered several epidemic outbreaks. The study also summarizes the epidemic prevention measures and thoughts across different periods, ranging from initial isolation methods to more complex social relief and medical assistance. Notably, Confucian thought and the Yin-Yang and Five Elements theories had a significant influence on epidemic prevention concepts. The prevention strategies and ideological evolution during the Han to Tang periods reflect the ancient Chinese rulers' understanding of the relationship between humans and nature and their efforts to maintain social stability. By analyzing the evolution of epidemic prevention measures, this study provides historical insights into the ways ancient societies addressed public health crises.

Keywords	Epidemic Prevention, Social Stability, Confucian Thought, Yin-Yang Theory, Public Health Crisis

Paper ID	119
Author(s)	Takahiro Endo
Title	How Local Wells Worked for Disaster Risk Reduction: A Case Study of the 2018 Western Japan Flood

Abstract

Securing a stable water supply is one of the most important issues following a disaster. This problem not only provokes public health concerns but also imposes severe restrictions on the long-term restoration process. Although various efforts to enhance tap water infrastructure resilience, such as seismic reinforcement and system redundancy, have been carried out across Japan, progress has been slow. Recently, local wells have gained attention as alternative water sources in response to recent disasters. Located in affected areas, local wells provide easier access compared to water trucks, which must be transported from outside. Local wells can provide water promptly at the owners' discretion. While groundwater is not always potable due to quality concerns, it plays a crucial role in meeting domestic needs, such as for toilets and washing, which require far larger volumes than drinking water. This paper explores how local wells helped mitigate the impact of water cutoffs, with special reference to the extensive flood disaster of 2018 (2018 Western Japan Floods). Although local wells were very useful after the disaster, how they were actually used is not well documented. Using privately owned wells for disaster risk reduction represents a form of groundwater governance. However, previous studies on groundwater governance have focused on normal circumstances and overlooked emergency scenarios. This study is the first

attempt to expand the scope of groundwater governance research.	
Keywords	water, disasters, well, groundwater, emergency water supply

Paper ID	133
Author(s)	Chang Liu, Tomoko Shiroyama and Akiyuki Kawasaki
Title	Estimation of the structure efficiency that caused different relief responses against flood from a top-down perspective

Abstract

The 1931 Changjiang Flood, together with the 1954 Changjiang Flood, have been recognized as the two most catastrophic hazards ever recorded in Chinese modern history. Our previous research had found that although the inundation area of 1954 flood was 50% wider than 1931, the overall economic loss of 1954 was only 30% higher. In order to clarify this mismatch, we had developed an agent-based model simulating the behavior of peasants living in Huanggang County, Hubei Province during flood period. Our result had indicated that the peasants' evacuation decision was highly sensitive towards relief amount and timing. For instance, 10% decrease of relief amount could result in an increase of evacuation ratio from 15% to 40%. Therefore, sufficient and prompt relief might be able to explain the relative success of 1954 flood response. However, what has caused the different relief responses is still unclear. To answer this question, here we've developed a system dynamics model to simulate how much relief was collected and allocated through hierarchical management structure in both 1931 and 1954. Our result showed that due to the elimination of landed class and external stress (e.g. civil war), the structure efficiency (measured by the ratio of relief allocated to collected within certain time period) was 10%~20% higher in 1954. Overall, we've quantitatively analyzed the top-down structure of Chinese historical relief system, about which further investigations are highly expected.

Keywords	Disasters, Humans, Flood, System Dynamics, Relief

Paper ID	124
Author(s)	Heli Huhtamaa
Title	Far-flung disaster: Global consequences of the 1600 CE volcanic eruption

Abstract

In 19th of February 1600 CE, Peruvian volcano Huaynaputina started to erupt. This released large amounts of sulphur compounds in the atmosphere, which soon oxidised into sulphate aerosols that started slowly circulating across the globe. These volcanic aerosols reflected incoming solar radiation back to space, and, as consequence, Northern Hemisphere experienced extremely cold temperatures in the following year 1601 CE.

The cold climate extreme caused crop failure and hunger across the hemisphere. Ireland, Norway, Sweden, Finland and Estonia recorded frozen yields and human misery. In Russia, the 1601 crop failure coincided with a period of internal political turmoil, the so-called Times of Trouble. There, the food shortage escalated into devastating famine, taking the lives up to 2 million people.

This poster demonstrates the spatial and temporal extend of the climatic impacts of the 1600 eruption(s), as well as detect some of the most fatal human consequences of the disaster. By doing so, I wish to demonstrate how a natural hazard on one side of the globe might trigger a societal disaster on the other.

Keywords	Disasters, Foods, Humans, AIr

Paper ID	136
Author(s)	Niklaus Emanuel Bartlome
Title	Exploring the past global climate – ClimeApp: Data processing tool for the ModE-RA Global Climate Reanalysis

Abstract

ClimeApp is a newly developed web-based data processing tool for the state-of-the-art ModE-RA climate reanalysis. It presents temperature, precipitation and pressure reconstructions with global coverage and monthly resolution over the last 600 years. These can be visualized and customized as maps or time series. Furthermore, the app allows integration of historical information with climate data through composite, correlation and regression functions. The ModE project itself contains three data sets - ModE-RA, ModE-Sim and ModE-RAclim – all accessible through the app. It also allows for visual exploration of the huge array of source material used in the ModE project. To showcase the app, this poster will look at the regional climate impacts of two major volcanic eruptions – the Koma-ga-take/Parker eruption (1640/1641), and the eruption of Krakatoa (1883) – showing how they can be investigated using the functions and applications of ClimeApp and the ModE database. Since such natural disaster events can also severely impact human society, the poster will also compare these climate impacts to contemporary historical data, using functions within ClimeApp. This will demonstrate how ClimeApp can be used not only in research, but also in teaching and science communication, as well as highlighting the potential for similar interfaces in other disciplines. ClimeApp is available at https://mode-ra.unibe.ch/climeapp/

Keywords	Disasters, Humans, Volcanic Eruptions, Palaeoclimate, Web tool