

Paper ID	241
Author(s)	Muzayin Nazaruddin
Title	Integrating Indigenous and Modern Knowledge in Mitigating Volcanic Hazards on the slopes of Mt. Merapi, Java
Abstract	
<p>This paper delves into the intricate relationships between indigenous knowledge and modern scientific knowledge in the context of disaster mitigation and management. It addresses one of recurring fundamental topics within disaster studies: conflicts and contestations between indigenous and modern knowledge in mitigating future disasters, comprehending disaster events, handling emergency responses, and executing recovery processes. Taking the case of the tight interrelationships between the Javanese people and Mount Merapi, this paper argues that the interplay between traditional and modern perspectives encompasses not only conflicts and contestations, but also collaborations and convergences. From a modern disaster mitigation perspective, Merapi has been extremely catastrophic; acknowledged as the most active volcano in the globe, with over 23 eruptions in the last century. Yet, for centuries, a large number of Javanese have lived in close proximity to Mount Merapi's summit. A major Javanese polity, the Mataram Sultanate (present-day Ngayogyakarta Sultanate), established its economic and political centre just 30 kilometres from Mount Merapi in the early 16th century. From a historical and anthropological perspective, this raises thought-provoking questions about the knowledge and practices that Javanese people developed regarding volcanic eruptions in order to sustain and further develop civilization around an extremely active volcano. This paper asserts that: 1. Javanese people have cultivated cultural ideas concerning the volcano and its eruptions, incorporating mitigation strategies, represented in their cultural texts and symbolisms. 2. These Javanese mitigation strategies have a long history of encounters with external knowledge, including volcanology and modern disaster management frameworks, resulting in a kind of hybrid volcano-related and disaster-related knowledge.</p>	
Keywords	indigenous ecological knowledge, disaster, volcanic eruption, volcanology, Merapi.

Paper ID	242
Author(s)	Tai Ying-Feng
Title	The Evolution and Lessons of Flood Management in the Taipei Basin
Abstract	
<p>The Taipei Basin was formed when the Taoyuan Plateau in the south experienced tectonic uplift, causing the Dahan River, which originally flowed toward Taoyuan, to redirect into the Taipei Basin, creating Lake Taipei. However, this occurred more than two million years ago. Today, Taipei is a bustling capital city, though subtle traces of its ancient lake history can still be observed during heavy rainfall.</p> <p>The basin's topography, combined with the presence of numerous rivers, makes flood management in Taipei very crucial and challenging. Fortunately, after countless flood disasters, Taipei's rivers have been transformed into riverside parks lined with towering levees, creating a unique landscape. On clear days, these riverside parks serve bicycling, playground, and parking lots. When typhoons approach, the public would be urged to move their vehicles parked within the riverside area to prevent flood damage.</p> <p>To further reduce surface water accumulation, roads have been gradually resurfaced with permeable paving over the past three years. This allows rainwater to seep underground, effectively mitigating surface flooding and enhancing traffic safety. These strategies mark a shift from the past approach of isolating disasters with towering flood barriers toward a concept of "flood resilience," where the city can coexist with a manageable level of</p>	

flooding.

In addition to evolving infrastructure strategies, I have observed in elementary school ,children living among these flood prevention technologies often remain unaware of their presence. Therefore, educating students about such technologies can be a valuable approach to introducing climate change adaptation concepts.

Keywords	Levee, Flood Management, Climate Change Adaptation
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Paper ID	266
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Author(s)	SHIZUMA MAMASE, Masahide Ishizuka, Yoshiki Mizobuchi, Saki Tashiro, Masazumi Mukaiyama, Hiroshi Yamago, Kazuyoshi Maeda, Jinno Natsuki, Takayuki Sangawa, Yasuhiro Oori, Momota Naoki, Yasuhiro Mino and Taizo Yuasa
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Title	Wide-Area Monitoring of Urban Flood Using Low-cost IoT sensors and For Clarify the Factors of Water Disaster
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Abstract

In recent years, urban flooding caused by heavy rainfall has been increasing. It is essential to figure out the conditions of inundation and respond to the disaster as quickly as possible to solve this problem. However, water level gauges and monitoring cameras are expensive and costly to install, and the current method of confirming disaster conditions is based on patrols and reports from local residents, which is time-consuming and manpower-intensive. The purpose of this study is to contribute to the prevention and mitigation of flood damage by installing inundation sensors in Kagawa Prefecture to observe wide-area flooding and determine the status of inundation.

We participate in the Ministry of Land, Infrastructure, Transport and Tourism's Inundation Sensor Model Project, and the installation status and inundation status are summarized and made available to the public on the Internet. The size of the sensor is 49mm x 170mm x 33mm/110g, and the real-time inundation status can be monitored through the Internet without a relay point. The sensors are installed in 46 locations, including roads, ditches, underpasses, underpasses, and rivers in Takamatsu City and Marugame City, Kagawa Prefecture, Japan. It is expected that the data obtained from this research and the publicly available system will help local residents to recognize areas at high risk of flooding, raise their awareness of appropriate actions, and strengthen disaster prevention measures.

Keywords	Disaster, Sencing Technology
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Paper ID	279
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Author(s)	Taiichi Hayashi, Toru Terao, Fumie Murata, Masashi Kiguchi, Yusuke Yamane, Azusa Fukushima, Masahiro Tanoue and Hideyuki Kamimera
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Title	History of Meteorological Disasters in the Northeastern Indian Subcontinent
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Abstract

In the Northeastern region of the Indian subcontinent is most vulnerable area of several meteorological disasters. One is the serious floods in Brahmaputra basin in Assam as well as Bangladesh plain in the summer monsoon period between June and September. This huge amount of rainfall is the benefit of the water resource for the human living, but the excessive rainfall amount causes serious disasters of flooding in this region.

The other case of the meteorological disaster is strong wind, heavy rainfall and storm surge caused by the fierce cyclones at the middle of the Bay of Bengal before and after the rainy season.

We will review the typical cases of the above historical disasters. In addition, some results of infall observation for clarify the mechanism this tremendous rainfall for more than twenty years using the observed rainfall data of more than twenty rain gauges installed in Assam and Meghalaya, and Bangladesh. The unique characteristics of the temporal and spatial behavior and distribution of rainfall patterns are analyzed.

Keywords Disaster, Flood, Cyclone,

Paper ID 220

Author(s) Zhen Yang

Title The Climatic and Societal Impacts of Volcanic Eruptions in 17th-Century China: A Comparative Study

Abstract

Seventeenth-century China is renowned for its prolonged period of cold weather, which further led to declining crop yields and societal instability. Recent research suggests that certain climate disasters during this century are related to the atmospheric impacts of several explosive volcanic eruptions.

This paper categorizes and quantifies climatic stressors (e.g., drought) and selected societal events (e.g., poor harvest, famine), applying quantitative methods to examine the timing and statistical significance of their potential association with explosive eruptions. It then focuses on two historical periods, 1590-1620 CE and 1630-1660 CE, for comparative case studies of the climatic and societal forces, atmospheric optical anomalies, and societal responses to consecutive calamities. These periods were selected based on natural evidence and historical context. From polar ice-core evidence, we know that the 1600 CE Huaynaputina (in Peru) eruption and the 1640/1641 Koma-ga-take-Parker eruptions profoundly impacted the global environment and human societies. The two cases occurred in the Ming Dynasty (1368-1644 CE), which collapsed closely after the 1640/1641 eruptions. This comparative analysis furthers discussion of the distinct climatic and societal impacts of the two volcanic eruptions and assesses the effectiveness of disaster prevention and mitigation measures.

This research quantifies societal stressors from historical texts for future interdisciplinary research on climate-society dynamics. The mixed use of quantitative and qualitative methods allows the historical details and long-term patterns to complement each other, thereby offering a valuable lens for exploring the complex interplay between environmental and societal forces. It provides historical lessons and methodological tools to reconsider today's climate challenges.

Keywords Disasters, humans, volcanic eruptions

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