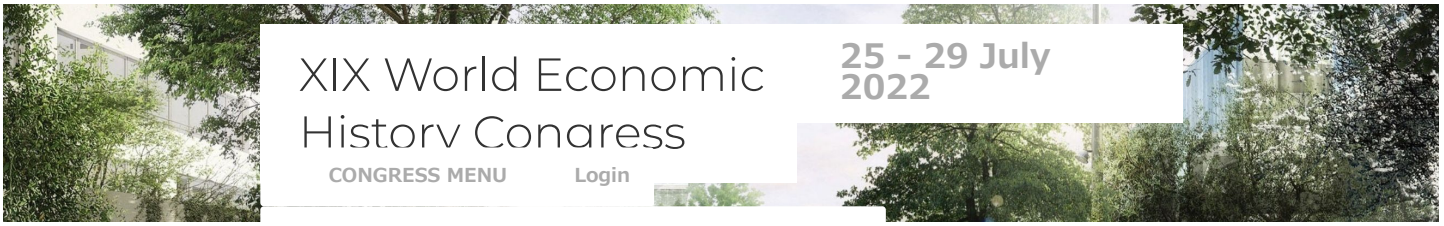

01 Days 01 Hours 46 Minutes 31 Seconds

BACK TO THE PROGRAM

July 26th 2022

PA.173 | Realms of Water: Environmental Socioeconomics of the Hydrosphere of Modern Asia

ADD TO MY AGENDA ADD TO MY CALENDAR

Parallel Sessions

09:00 - 12:30 - Recherche Sud - Room 0.016

Description

Purpose of the Session. Water has critically influenced the socioeconomics in Asia in the past and present. There are two reasons for this: one, the monsoons and seasonal rainfall have a significant impact on the economy, and two, many regions in Asia are terrains surrounded by water systems such as seas, rivers, lakes, and marshes that are part of the hydrosphere. Figure 1 gives an overview of the hydrosphere of the monsoon Asia with annual rainfall levels. The significantly large population living in and around the hydrosphere in Asia, faces the challenge of rainfall not always matching people's demand for water in terms of timing and location. At the same time, the annual fluctuation of rainfall threatens people's welfare both in terms of scarcity/droughts and of excessiveness/floods. Therefore, a key problem the region faces is how to cope with those mismatches in timings, locations, and quantities between the natural supply for water and the human demand for it. However, as Sunil Amrith rightly points out in his recent publication in 2018 1 , a social repertoire of institutions, organizations, policies, and technologies varies among localities, changes over time, and their initial intentions to resolve these challenges have had different outcomes. This session focuses on the watershed in Asia in terms of changes in polities, its exposure to the global economy, and the available technologies in the period from the early 19th century to the early 20th century, comparatively explores the efforts to cope with a climate and hydrology, and collectively examines economies and social welfare from the perspective of water. Data and Methods Although Fernand Braudel drew attention to the relationships between humans and the environment by employing a temporality called la longue durée, it has been difficult to historically capture the repetition and recurrence of seasonal cycles or longer natural cycles that affect the cycle of the seasons themselves such as climate changes. Collaborating with meteorologists and hydrologists, this session aims to challenge the methodological difficulties in understanding water and climate historically. When Asia became closely integrated with the global web of commerce in addition to being colonized from the early 19th century, specialists like meteorological officers and harbor masters started to regularly report weather and water levels under their jurisdictions. By constructing the meteorological database from those long- overlooked contemporary observations and then applying hydrological models and analyses to the data, we can historically reconstruct the natural environment of the time against which socioeconomic activities can be examined. Therefore, one of the key contributions of this session will be to propose new data sets and methods to study the interactions between the natural and social landscapes. Outcomes and Implications The session is divided into two parts: "Part 1: The Political Economy of Water in River Basins and around Sea Coasts" and "Part 2: Coping with the Climate through Telecoupling of Waterscapes." When the region was primarily an agricultural society, a key task of the government and other authorities was securing the supply of water as well as avoiding extremes like droughts and floods. In Part 1, the 1876–1879 drought in the Deccan plateau of India (Ogawa), and the transformation of river transportation in Burma (Charney) are examined in terms of the impacts and limitations of India's

the region. Although social sciences have conventionally regarded trade as an economic transaction in terms of money, hydrologists have drawn attention to the transfer of so- called "virtual water," namely, the movement of water embedded in crops between water- abundant and water-scarce areas. Keeping this hydrological argument in mind, the presenters examine the rice trade in the region, focusing on both suppliers like Bengal (Kanda), Thailand (Miyata), and Vietnam (Takahashi), and consumers like South China (Murakami) and Singapore (Kobayashi). The environmental socioeconomics of water in modern Asia merits special attention not only because of the region's sheer size in terms of population and area but also to comprehend the contemporary world and to look toward the future. The issues being raised in this session, such as the tension between public water governance and individual water rights, irrigation technology and finance, and local hydrology and long-distance trade, to name a few, are historically constructed but persistent problems. By drawing attention to these matters, this session seeks to open long-awaited dialogues between natural and social scientists, including historians, economists, ecologists, and social engineers inside and outside Asia.

Thematics

Q - Agricultural and Natural Resource Economics • Environmental and Ecological Economics

Organizer

Shiroyama Tomoko
Sayako Kanda - Keio University

Discutant

Kenneth Pomeranz - The University of Chicago
Sunil Amrith - Yale University [New Haven]
Peter Coclanis - The University of North Carolina at Charlotte [Charlotte]

Chair

Seshan Radhika

Papers

Revisiting the Great Famine (1876–1878) in the Krishna River Basin in India from a meteorological perspective

Michihiro Ogawa - The University of Tokyo
Seemanta Bhagabati - Thames Water Utilities Limited

Between 1876 and 1878, the Great Famine hit Western, Southern and Northern India. According to the famine commission under the British rule, about five million people were estimated to have died. Many researchers have conducted some spatial analysis of the event, however statistical analysis including extent and severity has not been amply conducted primarily due to lack of available data. In this research, we try to reconstruct the meteorological conditions of the target famine area (Krishna River basin) by using statistical point data and long-term gridded data. Using this generated rainfall data, the yearly and seasonal variability could be seen and were able to compare with the corresponding values for the famine period. Furthermore, combination of rainfall and demographic data based on Census of India since 1872 and the famine reports in the Krishna River basin showed how and where the famine damaged the agrarian society from another angle. We were able to identify the worst hit areas during the famine.

Water Circulation System of Yangzi River: From a Perspective of Chinese Maritime Customs Records

Takeshi Hamashita - The Oriental Library
Chang Liu - The University of Tokyo

After the Medical Office opened at the Hankow Custom in 1871, around 200 patients came to the Medical Office to see doctors every month and had medical consultation by doctors. Doctors recorded very detailed observation and classified disease and social background of patients. In 1869, Hankou suffered from heavy flood for more than three months. H.E. Hobson of the Hankou

to the Han hills for refuge…". This paper examines the records of disease and discuss the relationship between meteorological environment and disease in the Medical Report published by Hankou Maritime Customs. Firstly, a series of book called Encyclopedia of the Meteorological Disasters in China is digitized and quantified to provide the environmental background. Based on the quantified flood and drought results, the maps of flood damage in 1869 and 1870 are generated. From which the possible inundation area could be roughly estimated. Then, text analysis is applied to test the hypothesis that 1) flood will result in more patients getting waterborne diseases because of the exposure and increasing ponds and swamps; 2) drought will decrease the number of patients infected malaria as the disappearance of ponds and swamps depresses the number of mosquitoes, which is an important intermediate host of many diseases. The results have shown that the meteorological extremes may lead to certain epidemics through water system (e.g., flood resulting to the increase of schistosomiasis, drought resulting to the decrease of malaria) in humid region like Hankou. And the long-term hydrological data may be applied to analyze the health condition of one place in historical times. Overall, the Medical Reports of the CMCS together with local disaster records provide a possible method in historical flood research. We anticipated our study to be a start point for a more robust hydrology-health theory and more accurate historical medical dataset, which will be applicable for more detailed analysis and other regions and time.

Bengal Rice and the Great Famine of 1876–78 in India

Sayako Kanda - Keio University

As the granary of South Asia, Bengal had long been exporting large quantities of surplus rice to adjacent regions by river, sea, and land. This paper examines the rice export from Bengal by sea to other regions, namely Western and Southern India, during the Great Famine of 1876-78, and how rice was distributed between ports there. The famine of 1876-78 caused catastrophic damage to the society and economy in vast areas in South Asia, with enormous human losses. Severe deficiency in the monsoon rain in 1876 in Western and Southern India triggered the famine, although there were various reasons why the famine became so catastrophic and drawn out. However, having escaped from monsoon failure that year, Bengal continued to export rice to the famine-affected areas in South Asia. By comparing the famine years with average years, this paper illustrates with maps the role of Bengal in mitigating the famine in South Asia and the impact of such emergency relief on the society and economy in Bengal.

Divisions and Connections between Hydrosphere: Modern Singapore’s rice trade

Atsushi Kobayashi - Kyoto University

This paper purposes to investigate how monsoon Asia's diverse rice trade patterns, which were attributed to the region-specific socio-economic and ecological environment, increased the connectivity through the growth of intra-Asian trade during the modern period. Particularly, the analysis will focus on the functioning of Singapore as a transit hub, which adjusted regional rice trade structure and market integration to the development of intra-Asian and global economies.

DOWNLOAD

Rainfall and Rice Harvest in Thailand in the early 20th Century: An Analysis of Thai Rice Crisis from 1919 to 1921

Toshiyuki Miyata - Tokyo University of Foreign Studies

This research is a special attempt of environmental and economic history of Thailand, especially economic history of Thai rice by utilizing Thai meteorological data.Thailand developed rice production, especially, in the Chaophraya delta of the central region and increasingly exported rice in response to the rapid expansion of rice demand in Southeast Asia and the southern China in the late 19th century and the early 20th century. On the other hand, Thailand with a savanna climate has a rainy season and a dry season. Under the unstable water conditions in the rainy season, in a certain year, rice farmers in the Chaophraya delta had often to suffer the floods because of heavy rainfall. However, in another year, they could not avoid droughts because of rain

changes in Thai rice exports in relation to environmental data that has been overlooked in Thai socio-economic history, that is, rainfall, and river flow in Thailand during “Thai Rice Crisis”. The two reasons for this prohibition of rice export can be pointed out. One reason was that Thai rice price had risen sharply since the end of 1918. The background of this sharp rise of rice price was the strong foreign demand for Thai rice caused by the shortage of rice in the Malay Peninsula region, which was triggered by the decline in food stocks in India. In 1918, India suffered deficiencies in the wheat harvest. So, Indian Government imported big amount of Burmese rice. Exports of Burmese rice to British Malaya and the Straits Settlements were curtailed. The food situation in this region deteriorated rapidly. As a result, the demand for Thai rice increased sharply and rice exports from Thailand continued to expanded and Thai rice prices continued to rise in the first half of 1919. Concerned about this situation, Thai government decided to ban rice exports in June 1919. The second cause of Thai Rice Crisis was the extreme lack of rain since August 1919. Due to lack of rain, drought damage occurred in various parts of Thailand, and harvest of rice was extremely poor in 1919. Therefore, in December 1919, Thai Government decided to continue the Thai rice export ban from June, and continued rice export ban until January in 1921. Fortunately, the good harvest of the rainy season in 1920 dispelled concerns about a shortage of rice supply. In December 1920, Thai government relaxed rice export ban. Then, in January 1921, Thai government finally abolished the rice export ban policy and allowed rice exports. This study re-examines the damage situations of rice cultivation by region and the changes in Thai rice exports in relation to environmental data that has been overlooked in Thai socio-economic history, that is, rainfall, and river flow in Thailand during “Thai Rice Crisis” by utilizing the data of the Statistical Yearbook of Thailand.

Multidirectional rice trade and the stability of southern China’s food supply during the modern period: The case of the Pearl River Delta

Murakami Ei - Kyoto University

In this paper, we reveal the mechanism of rice supply by analyzing the rice import from the lower Yangtze region and abroad and rice production in southern China. At the same time, we analyze the relationship between food production and rainfall in the Pearl River Delta. This study shows the connection between the hydrosphere of Central and South China and that of Southeast Asia.

Impact of Meteorological Changes on Rice Market Efficiency: Evidence from Southern Vietnam in the Early Twentieth Century

Rui Takahashi - Tokai University
Masahiro Ikeda - Okayama Shoka University

This study focused on the impact of meteorological changes on the efficiency of the internal rice market in Southern Vietnam, called Cochinchina, in the early twentieth century. In general, rice market efficiency is affected by rice production and transportation performance. On the other hand, meteorological conditions, including precipitation, are closely related to rice production and transportation. We confirm the deterioration of rice market efficiency in Cochinchina around 1919 and clarify the impact of rainfall on the deterioration using three types of data: precipitation, internal rice or paddy price, and our original spatial data, which are shapefile georeferenced based on the map of Cochinchina in 1920. Meteorological changes caused decreased rice production in major rice exporters such as Burma, Siam, and French Indochina, including Cochinchina, from 1918 to 1919. Hence, high rice demand from other Asian areas occurred: rice exporting countries had no choice but to control and embargo their goods. This process impacted the performance of the existing rice market in rice exporters. Cochinchina also experienced a poor rice crop, and the influence of Chinese merchants and rice millers declined in the internal market of rice or paddy after 1920. As for the rice milling industry, small rice mills and Vietnamese millers rapidly increased and dispersed over the Mekong River Delta. The above observations are closely related to the deterioration of rice market efficiency around 1919. On the other hand, this market efficiency indicates transaction costs reflecting meteorological changes and transportation costs. Regional differences in rice or paddy prices depended on the rice market efficiency or transaction costs. Therefore, we constructed the time series of regional rice and paddy prices at the provincial level. Furthermore, we estimated the change in market efficiency in the Mekong River Delta by calculating the differences among rice prices (or paddy prices) in

variation of market efficiency by the provincial differences in rice or paddy prices related to rainfall, at least in short-term periods. Slight rainfall might have a more severe impact on the rice market efficiency in the short term. As for the flood, peasants adapted to this kind of disaster via their rice cropping pattern. However, the long-term variation of rainfall might have different impacts on the market efficiency from the short-term case. The cumulative impact of significant rainfall deviation up to the mid-1910s might affect the performance of the internal rice market from the late-1910s to the early-1920s with time lags.

DOWNLOAD

Transforming River Transportation in Colonial Eastern Myanmar, from Open Riverine Access to Closed Overland Systems

Michael Charney - SOAS, University of London

While the literature on the impact of colonial economic and transportation infrastructure on Burma has long been the subject of serious scholarship (Adas, Booth, Brown, Coclanis, Furnivall, and many others), the focus on “country” level economic, social, and demographic developments, both the positive and the negative, has meant a neglect of in-depth attention to change at the district and local levels. There has also not been a focus on the transformation of the hydrosphere, although scholars of the colonial economic in Burma have been inclusive of it in passing. The focus on the “big picture” has meant that while it is clear that colonial engineering had environmental consequences, scholars have accepted that the negatives did not outweigh benefits, such as improved economic productivity. In other words, the value of history has conventionally been viewed as explaining how Burma’s exports grew, not what the impact of change was locally and this obscures the local consequences of “national planning” and why problems then are relevant to changes in Burma today. This paper argues that the colonial impact on the relationship between Burmese in the Sittang Valley of Burma and its hydrosphere is as much about what changed or was lost as what took its place. Colonial engineering however much it may have built a more productive economy in Burma as a while, devastated local societies, economies, and ways of life built upon the precolonial relationship with the Sittang hydrosphere. The identification of the Sittang as a source of water for irrigation and not for transportation meant it was transformed in such a way that the waters were tapped, sapped, and lowered, ruining the local economies of river port towns. Local populations moved overland instead of by water, railways and the construction of road as feeder roads for the railway only, locked them into a particular economic relationship with the main port of Rangoon and made them dependent on the prices Indian, Chinese, and European mills were willing to pay.

The 1931 Yangzi River Flood: Spatiotemporal Analysis of the Natural Hazard and the Socioeconomic Impacts

Shiroyama Tomoko
Chang Liu - The University of Tokyo

Natural hazards in the past tend to be remembered as the extreme events that occurred in the specific year, for example, 1918 Spanish Flu, 2004 Indian Ocean Earthquake and Tsunami, and most recently, COVID-19, that is coronavirus disease 2019. However, to understand the natural hazard historically, it is crucial to follow more closely the interactions between natural impacts and human responses, not only annual but also monthly and daily sequences of the events. In addition to the question concerning “where”, that is the geographical aspect of the hazard, the problems concerning “when” and “how long”, that is the temporal aspect, critically decides the seriousness of the disaster. The different scales of time and space shed light on the multiple dimensions of the natural hazard, and thus lead us to consider new historical narratives. This paper focuses on the 1931 Yangzi flood, one of the most severe natural calamities in China up to the present, from the three different time-period/ geographical scale, namely annual/3000km×1600km, July-September/ 300km×400km, and daily hazard in July-August 1931/ in Hankou (10km×6km), exploring how the natural hazard spread along the river basin and beyond, how the societies were vulnerable to them, and what the outcomes of their responses were.
