

Ecohistory Program

SATO Yo-Ichiro | Program Director

The Ecohistory program investigates circulation, diversity, and resources from a historical point of view. We can find that there is historical causality embedded in every problem or phenomenon. This fact emphasizes the need to investigate the past to understand the present. The goal of this program is to contribute to contemporary and future societies. Like other RIHN research programs, it must also articulate global environmental issues, propose solutions, and deepen understanding of potential interactions between humanity and nature.

Current projects of the Ecohistory Program examine the environmental histories of two distinct areas, known as the 'Asian Green Belt' and 'Eurasian Yellow Belt'. In the former, communities managed to maintain sustainable livelihoods for approximately ten thousand years. In the latter region, many civilizations collapsed during the same time period. Is this understanding historically correct? What caused such difference in the productivity and sustainability of the two regions? This question is at the core of this research program; its answer is vital to the human future.

Completed Research	Leader	Title
H-03	OSADA Toshiki	Environmental Change and the Indus Civilization
H-04	UCHIYAMA Junzo	Neolithisation and Modernisation

Environmental Change and the Indus Civilization

Project Leader **OSADA Toshiki** RIHN

The Indus Civilization (2600 BC–1900 BC) is one of the four great ancient civilizations. It is known for its cultural and technological achievements—its characteristic seals and scripts, fortified settlements and drain systems—and also for its brief tenure. Its sites spread over 680,000 sq. km., not only along the Indus River but also along the Ghaggar River and in the Gujarat state of India. Drawing on archaeology, Indology, and palaeo-environmental investigation, this project attempted to determine whether and how environmental factors contributed to their short life and rapid decline. Especially through palaeo-environmental investigation, it also attempted to enhance understanding of the relationship between long- and short-term environmental changes and human civilizations, and thus contribute to contemporary debates of environmental change.

Principal findings

Our research on environmental changes centered around three issues. The first concerns the long-standing debate about the Ghaggar-Hakra River. It was identified as the 'mighty' Sarasvati River in the Rig-Veda text, and therefore considered critical to Indus agricultural systems. Our team, however, established that in the Indus period the Ghaggar was much as it is today, a rather small river highly affected by monsoon.

The second issue is the sea level change during the Indus period. Sea trade between Indus regions and the west was somewhat reconstructed through study of Mesopotamian cuneiform texts. Additionally, artifacts discovered at sites in Gujarat clearly indicate that they were centers of trade with Mesopotamia and Africa. Our examinations of sea level change indicate that the important seaport Lothal fell out of use in the first millennium BC, suggesting that regional environmental change was related to the decline of trade along the coast of Gujarat.

Thirdly, our palaeo-environmental team extracted cores from Rara Lake in the Lesser-Himalayan region in 2009 in order to reconstruct long-term climate changes in South Asia. The analysis of these cores established that the summer monsoon intensified as the Indus civilization declined.

Due to the outcome of these studies we conclude that Indus Civilization underwent a process of transformation due to population migration from the Indus river basin to monsoon affected areas, causing gradual disintegration of trade network which connected different regions of the Indus society. This migration was caused by both long- and short-term environmental changes. The Indus declined; it did not collapse suddenly due to drastic natural or social events.

Our contributions to Global Environmental Issues

As Jared Diamond showed in his celebrated book "Collapse", past civilizations teach us many things. The regional diversity of natural and social environment and the trade network connecting different regions found in the Indus Civilization remind us of modern Indian societies rather than the other ancient civilizations. This diversity of South Asian societies which apparently continued from the Indus period is something we need to value when we think about the future of this Earth.

In addition, the proxy data obtained from Rara Lake cover not only the Indus period but the period of over several thousand years. We consider that they will be useful to the future study of climate change on a global scale.

Research communication

When we presented the outcome of our research at the conference of South Asian Archaeology in Paris in July 2012, Professor Mark Kenoyer, authority of the Indus archaeology, congratulated the completion of our project, saying that the project had made a great contribution to the South Asian archaeology. Currently we are trying to start a new project which will inherit the outcome of the Indus project. As regards academic publications, our presentation at the Chapman meeting of AGU in March 2011 proving that the Ghaggar was not a mighty river was finally published in the monograph of the meeting. Other publications are listed on the RIHN project website.



The Coastal Indus Looks West

Fortified coastal settlements suggest that the Indus Civilization, once considered an insular society, shipped goods to the west

DHOLAVIRA, INDIA—Most of the year, this small island near the Pakistan border is surrounded by thick salt flats in the estuary called the Rans of Kutch. In late January, the midday heat is already intense, and the land is brown and barren. Yet more than 4000 years ago, architects and engineers designed a vast city here with high stone battlements,

is during the height of the Indus River, or Harappan, civilizations.

And yet Dholavira is hundreds of kilometers from the cities long considered the heart of the Indus River Valley civilization, Harappa and Mohenjo Daro, which lie far upstream on the Indus River in modern-day Pakistan. But recent digs and surveys in India's western-



Indus passports? Kanner's oval-shaped pendants may have been related to trade and travel.

Photo From *SCIENCE* 328: 1100 (2010) Reprinted with permission from AAAS

Neolithisation and Modernisation: Landscape History on East Asian Inland Seas

Project Leader **UCHIYAMA Junzo** RIHN

Project research focused on landscape change in the East Asian Inland Seas (the Japan Sea and East China Sea), a region of rich cultural and landscape diversity, from the end of Ice Age up to the present day. It emphasized two revolutionary processes of landscape shift in particular, Neolithisation and Modernisation, in order to develop a subtle and profound understanding of landscape and environmental issues in the region, and so inform a solid landscape protection and development agenda.

Earlier described as a static composition, landscape change is now considered as a process of interaction between physical environment and the culture and value systems of the inhabiting people. In the course of their everyday activities, people apply their environmental perceptions and skills to change their environment in accordance with their values and beliefs. The resulting landscape will become the nexus of identity for the next generation, which will in turn alter its environment according to its abilities and imagination. Since landscapes are the stages of everyday life, landscape study can reveal how and why environmental issues arise and can best be addressed.

Project achievements

Comparative studies of periods of significant landscape change in key areas of the East Asian Inland Seas (Fig. 1) revealed several significant insights (Fig. 2):

- (1) Neolithisation was not a short-term revolutionary event, but can be defined as a process lasting for millennia in which a sedentary lifestyle and

agricultural landscapes gradually and permanently replaced previous foraging ones.

- (2) Modernisation is also a long-term process lasting for centuries, in which inter-regional networks associated with an expanding division of labour and homogenized forms of landscape were created through industrialization and extensive market systems.
- (3) Neolithisation brought about the mental separation of the human domain from nature, while modernisation created the concept that humans can subordinate natural surroundings to their control large-scale resource exploitation and land development.
- (4) Given the considerable impact of Neolithisation and Modernisation on contemporary landscapes, which themselves serve as a material and cultural base of present human-nature interactions, long-term historical perspectives should be brought to bear on future environmental policies.
- (5) The East Asian Inland Seas have allowed intense human interactions and so supported cultural unity within diverse local landscapes since prehistory. It is therefore indispensable to recognize such areas sharing historico-cultural backgrounds as areal units relevant to future environmental protection and landscape management.

Research communication

Project outcomes were published in academic journals and books, including a three-volume series on landscape history, and presented at various national and international congresses and symposia. The project has also been editing a special volume of the Journal of World Prehistory and creating an atlas of historical landscapes for the general public.



Figure 1 East Asian Inland Seas and NEOMAP workgroups

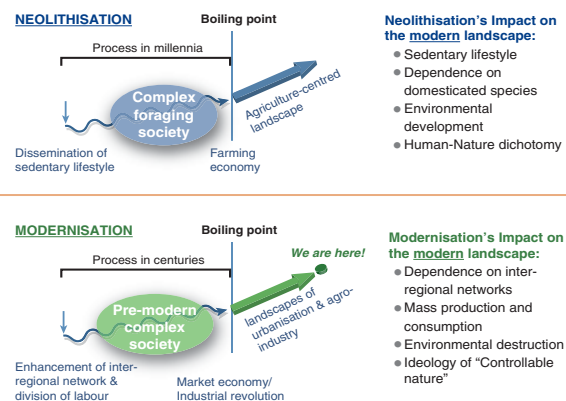


Figure 2 Neolithisation and Modernisation as historical processes of major landscape shifts