Kazunobu Ikeya
William Balée *Editors*

Global Ecology in Historical Perspective

Monsoon Asia and Beyond

Springer

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Editors
Kazunobu Ikeya
National Museum of Ethnology
Suita, Osaka, Japan

William Balée
Tulane University
New Orleans, LA, USA

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Preface

This book primarily examines human–animal and human–plant interactions in monsoon Asian forests (Southeast Asia and Japan) and inland waters (China). The relationship between plants, animals, and humans in Asia is quite unique from a global perspective. For example, "satoyama" in Japan means ecotone area, or the boundary between a village and a forest. There, as the number of inhabitants has declined, bears, wild boars, and other animals increasingly ravage crops, sometimes attacking humans as well.

By showing the regional nature of human–animal and human–plant interactions in Asia, this book provides for the first time a framework for understanding the world's animal and plant–human relationships. It is assumed that the relationships between humans and animals and plants have been diverse for millennia, including hunting, taming, semi-domestication, and full domestication. At the same time, for regions outside of Asia, the extent to which these diverse relationships were adapted and how diversity was formed is explained from the perspective of historical ecology. Therefore, comparative cases from Central Asia and the Americas (whales in the Arctic, sea turtles in the Caribbean, and plants in the Amazon) are also featured in this volume.

Readers can expect to derive perspectives on the coexistence of human–animal and plant–animal relationships in the near future. The conservation of rare species, diverse habitats, and biodiversity is a central theme in considering the relationship between modern civilization and the global environment. In post-industrial Japan, one focus has been the protection of iconic animals such as storks, crested ibis, dugongs, and sea turtles, while at the same time damage to crops and humans by deer, wild boars, monkeys, bears, and other common animals has become an important social issue. How can the world's 8.0 billion-plus people live in harmony with other species?

We would like to get some hints on how to solve the problems we are facing. This book collects research papers that capture the dynamics of human–animal and human–plant relationships from anthropology and adjacent disciplines. The individual papers were presented at the National Museum of Ethnology in Osaka, Japan, on March 19–21, 2018 under the international symposium entitled "Human Relationships with Animals and Plants: Perspectives of Historical Ecology." The papers

are based on those reported at that international conference, with additions and corrections.

In this symposium, we were concerned primarily with Asia, a large region of the world where local, in-depth studies of human relationships with animals, plants, and environment are often lacking and/or not widely disseminated in English-language publications. In each case, the more we look, the more we can see that the grounds on which local economies, cultures, and societies have been based have also been changing, in the past and present. Under these circumstances, how is it possible to generalize about human relationships with nature, and draw any conclusions about what may happen in the future? Our approach is to make comparisons across time and space using important case studies. The contributors to this volume are experts in very diverse disciplines, time periods, and geographical areas, but are all concerned with the implications of historical-ecological research for the future of humanity and the natural—or not-so-natural—world on which we depend. The grounds are changing, and we must seek new ways of living, and new ways of looking at humans, animals, and plants.

In April 2017, the National Museum of Ethnology launched a 6-year special research project to study the challenges facing contemporary civilization. The project is called "Contemporary Civilization and the Future of Humanity: Environment, Culture and Humans." This international conference was held in the first year of the project. In the past few decades, changes such as globalization and global warming have become threats to the future of our plane, and since 2017 those threats have only increased. At the same time, these changes are also changing the relationships between people and animals, and between people and plants. In particular, these keystone relationships in monsoon Asia provide unique facts from a global perspective.

This book aims to remedy the current status of these relationships, which have not been well documented. We hope that the book provides readers with an insight into the importance of human–nature relationship in the world, as well as exploring the unique dynamics of the relationship between creatures and people in monsoon Asia.

Osaka, Japan Kazunobu Ikeya

Acknowledgements

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Introduction

Nature and Culture in Globalized World

Modern human beings, *Homo sapiens*, were born in Africa about 300,000 years ago. After emigrating outward from Africa about 100,000 years ago, they dispersed throughout continental Eurasian (Bolivin et al. eds. 2017). Since that exodus and dispersal, they have expanded their living areas throughout the Americas and islands of Oceania. Along the way, they have adapted to various environments such as arctic regions and islands by accommodating and domesticating other creatures, plants, and animals, for use as food and other resources. Thereafter, human beings built cities and developed civilizations, but humanity has been unable to survive at any time without reliance on other creatures. At present, more than eight billion people live throughout the world. The important issue has arisen of how we can coexist with other species.

As a timely and salient example, in our globalized modern world, one cannot ignore the difficulties posed by zoonotic diseases. For example, the new coronavirus disease, which spreads throughout the world during February–March 2020, is said to have originated in a seafood market in Wuhan, China. Reportedly, small animals such as pangolins, which are creatures often used in traditional Chinese medicine, transmitted the virus to humans (Cyranoski 2020). Subsequently, the virus spreads from Wuhan City to every extent in China. Along with the movement of people in our modern world, it spreads as a matter of course throughout the world, causing hundreds of thousands of deaths. The World Health Organization (WHO) declared the new coronavirus disease a pandemic, calling into question how humans can coexist hereinafter not only with the coronavirus itself but also with wildlife, the source of the virus.

Mutual interactions among humans, animals, and plants must be considered by integrating ethnological, historical, and archaeological perspectives. Integration will enable us to suggest methods for sustaining nature, culture, and civilization in a good balance. Conservation of rare species, diverse habitats, and biodiversity in general is a central theme for considering relations between modern civilization and the global

Fig. 1 A settlement and Satoyama (second forest) in the rural area of Japan. Bamboo forest extends behind the house

environment. Preserving iconic animals such as the stork, ibis, dugong, and sea turtle has been emphasized post-industrial Japan, whereas damage to crops and humans by commonly encountered animals such as deer, wild boars, monkeys, and bears has come to pose important social problems (Knight 2003; Ikeya ed. 2010).

This book aims to consider the present conditions and the history of utilization, extinction, and preservation of plants and animals by humans, from prehistoric to modern ages. Historical-ecological approaches (integrating archaeology, historical research, environmental and natural sciences, and cultural anthropology) will be used to address issues surrounding the relation between modern civilization and environment. For example, forest landscapes in the Amazon have recently come to be regarded as a cultural product to a large extent (Balée, 2006). Whether this view can be generalized to other forest regions of the world will be examined by examination of the contrasting tropical and temperate landscapes of the Amazon and Japan (Fig. 1). *Satoyama* is a Japanese term applied to the border zone or area between mountain foothills and arable flat land (Tekeuchi et al. 2003).

Interactions among human society, animals, and plants will be considered in terms of their global, continental, and regional aspects. Each book chapter will examine the history of human effects on specific environments in the world, with examples from the arctic area (Alaska), archipelagoes and oceans (Caribbean Sea), forests (Japan, Thailand, Indonesia, Bangladesh, Brazil), and inland waters (China).

This book of contributed chapters covers current conditions and the long past of utilization, extinction, and preservation of plants and animals by humans while adopting a scope that encompasses prehistory to the present, using a self-consciously

historical perspective throughout. Most of the authors employ approaches which are amenable to historical approaches adopted for studies of cultural anthropology, archaeology, historical research, and environmental and natural sciences. We adopt this central theoretical program of historical ecology to address issues surrounding the relations between human civilizations and natural environments.

Relations Between Humans and Other Creatures: Researchers' Perspectives

Historical-Ecology Approach

Numerous well-known studies of historical ecology of the Anglosphere have included the introduction of research trends by William Balée (2006). In this book, global trends in "historical-ecology" research, including those of Japanese regions, will be reviewed. Research examining aspects of Africa, Oceania, and northeastern Asia has advanced. By introducing the modern circumstances prevailing in Japan, the question of whether a new horizon can be created in this field through input of research conducted in Japanese-speaking regions will be examined.

Historical ecology internalizes core postulates related to qualitative types of human-mediated disturbance of natural environments and their effects on species diversity, among other parameters. A central term used in historical ecology to situate human behavior and agency in the environment is the landscape, as derived from historical geography, instead of the ecosystem, which is a term borrowed from systems ecology (Balée 2006:75).

For example, many forest landscapes in the Amazon and in other parts of the Neotropics (e.g., Balée and Erickson 2006; Levis et al. 2018, 2019) and even Paleotropics (e.g., Fairhead and Leach 1996) have in the past 25 years come to be regarded as cultural products, i.e., as a result not of preexisting environmental conditions, but of human activity. Whether this view can be generalized to other forested regions of the world, particularly to temperate zones, will be examined by comparison of the contrasting tropical and temperate landscapes of the Amazon and Japan of Monsoon Asia.

Numerous studies of historical ecology have investigated aspects of the Americas (both tropical and not), Europe (Crumley 1994), and Africa (Fairhead and Leach 2012). We would add an Asianist dimension to this body of work, in addition to new chapters elucidating diverse subjects that are not necessarily Asian. We specifically seek to expand coverage by historical-ecological and ethnobiological approaches to Monsoon Asia, which is generally the region affected by the trade winds of the Western Pacific, South China Sea, and eastern reaches of the Indian Ocean. Monsoon Asia coincides with the coastlines and interiors, islands, and larger land masses where

rice cultivation either in irrigation systems or generalized swidden gardening can be found as an important feature of local societies and food production.

Another goal of the work presented in this volume is to bring historical-ecological work to scholarly Japanese audiences, for whom the emphasis is on environment and culture. The history of environmental anthropology and ethnobiology in Japan is reviewed herein. By introducing the prevailing circumstances in Japan, whether a new horizon can be created in this field through the input of research in the Japanese-speaking regions will be examined. In Monsoon Asia, even where the relations between people and biota (both plants and animals) are distinct from those of other world ethnographic regions, we analyze these relations from the same perspective and research framework. In this sense, the book includes several chapters specifically devoted to Monsoon Asia along with a select sample of work addressing the Americas and Africa. Finally, human history and civilization are examined from a global standpoint based on the mutual relations among nature, culture, and civilization. The phenomena related to the theme of this book will be discussed in the field, covering the immediate surroundings and the entire globe.

"Historical-Ecology" Research Among Japanese-Speaking Scholars

How are these terms different from the term historical ecology, which is used in English-speaking regions? In Japanese-speaking regions, terms such as ecological history (Umesao 2013), an ecological view of history (Umesao 2013), environmental history, and eco-history have been used particularly as concepts of historical ecology. Human history and civilization in Japan are discussed herein from a historical-ecology perspective.

Japanese studies of historical ecology are classifiable into the following three themes. First, human history and civilization or human history and culture are discussed from a historical-ecology perspective in Japan. Tadao Umesao (2013) pointed out that, in relation to the Eurasian continent, Japan, located far eastward, and Western Europe, situated far westward, had a common developmental stage in modernization from the viewpoint of the ecological history of civilization (Fig. 2). Komei Sasaki (1982) demonstrated that a common culture, particularly a shifting cultivation as a cultural complex, exists in broad-leaved evergreen forest zones, extending from Japan to Bhutan through Yunnan Province in southern China, from the standpoint of ecological history in culture. These authors developed deep historical views of culture and civilization on continental scales and throughout dry and wet ecological zones of Eurasia. Nevertheless, these views are often criticized because of their ambiguous time bases. Although these views retain their salience, they require testing and continued examination through further research in archaeology, history, and other disciplines. In his own synthesis of all these disciplines, Yamamoto (2014) has described the dynamic history of agricultural societies in the Andean Highlands.

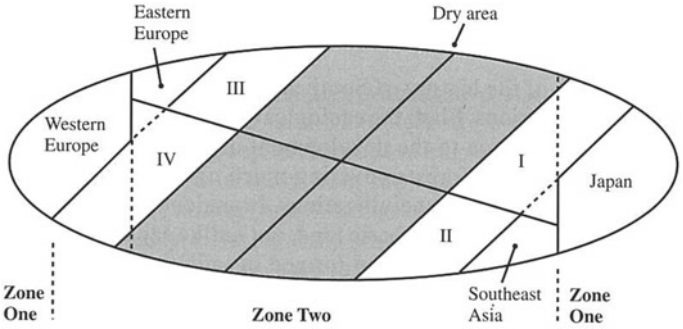

Fig. 2 Zones of modernization on the Eurasian Continent (Umesao 2013)

The Andean studies included comparison with highland ecology and civilizations in Himalaya and Tibet, the status of agriculture, stock-raising and hunting, and modern transformations in farming villages and ecotourism (Yamamoto ed. 2019).

Second are historical studies of animal and plant domestication. A collection of papers related to the domestication of plants and animals in the history of humankind, as edited by Yamamoto (2009), brought together research work that had been conducted in ethnobiology, archaeology, agriculture, and ethnology. The domestication of rice, corn, potatoes, swine, and fowl was discussed. The volume represents a landmark for historical-ecological research in Japan. In his own synthesis of all these disciplines, Yamamoto (2014) described the dynamic history of agricultural societies in the Andean Highlands. Peter Matthews (2014) specifically examined the distribution, ecology, and uses of wild taro populations to test theories related to domestication and dispersal of the crop (Chapter "Historical Changes in Human Relationships with Whales: Historical Ecology of Iñupiat and Bowhead Whales in Alaska, USA").

The last are studies of prehistoric human movements and their environmental adaptation. In ecological anthropology, relations between nature and culture have been studied in relatively closed or local ecosystems. Hitoshi Watanabe reconstructed the subsistence activities among the Ainu before World War II (Watanabe 1973), and Takashi Irimoto published work on the economic changes of the Ainu living along the Saru River in Hokkaido for the past 200 years (Irimoto 1988). Working in Oceania, Michiko Intoh has integrated studies of archaeology, ecology, and environmental history to explain the movements and adaptations necessary for human life in Oceania (Fitzpatrick and Intoh 2009). Furthermore, although working in Oceania, and widely in Southeast Asia, Ikeya (2002) has worked mainly with Kalahari hunter-gatherers, integrated social, historical, and ecological observations, and has published three collections of papers (Ikeya et al. 2009, 2017; Ikeya ed. 2017) elucidating the relations between hunter-gatherers and their neighbors, from prehistory to the present.

As described above, most studies of historical ecology in Japan have been conducted under three themes: environmental and cultural history or environmental

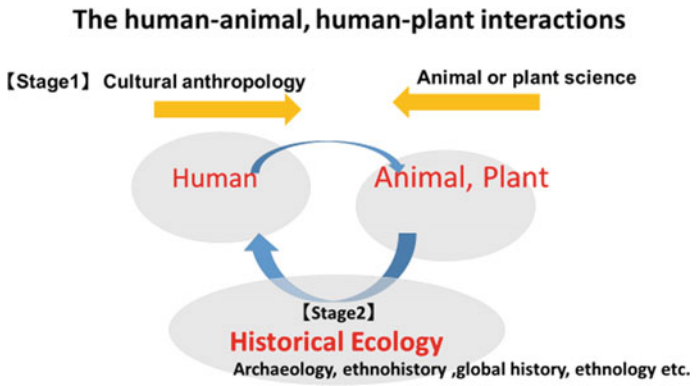

Fig. 3 Framework of human–animal and human–plant interactions

civilization history, animal and plant domestication history, and human movements and their environmental adaptation.

Three Stages to Comprehend Human–Animal and Human–Plant Interactions

Human–animal and human–plant interactions are examined by the setting of three stages. Stage 1 is "contemporary human–animal and human–plant interactions in Asia." Ethnological, zoological, and botanical studies are included mainly (Part II and Part III) in that stage. Here, interactions are studied by limiting the period to short terms, i.e., several dozen of years. Stage 2 includes "comparative perspectives in historical ecology." Archaeology and ethno-history are mainly included (Part IV). In this stage, study is conducted by examining long-term interactions, i.e., those developing over several hundreds or thousands of years. Lastly, stage 3 is "modern society with its nature, culture and civilization." Here, ethnology and other multidisciplinary research fields are related (Fig. 3).

Monsoon Asia and Other Areas: From Ecosystem to Civilization System

Human relations with animals and plants in Asia are unique worldwide. Wild animals assume a cultural importance throughout Asia (Knight 2004:1). Elephants, tigers, monkeys, birds, and snakes are among the creatures in proverbs, myths, legends, religion, and art. Characteristics of those relations, especially in Monsoon Asia, can be understood from earlier studies.

Human–Animal: People–Wildlife Coexistence and People–Wildlife Conflict

We shall study human–animal relations worldwide by dividing them into two cases according to whether the animal is useful or harmful for humans. Wildlife can be harmful as well as useful. Hunting is used as a form of pest control among rural societies, including fox-hunters and wild boar-hunters (Knight 2004:56). As examples demonstrating useful animals, people can use animal meat or milk as food (Donovan 2004:90–91). They also use fur or hides for wearing and rhinoceros horn and bear gallbladder as traditional Chinese medicines (Donovan 2004). They even appreciate stuffed animals for ornamental purposes (Peace 2005). By contrast, animals can be harmful: elephants and large feline animals attack people in Africa and in India. Crops and livestock are damaged by wildlife.

In Monsoon Asia, people have used more diverse animals including whales and dolphins than in other areas (refer to Kalland 2002). Taking an example of bovines, various species have been domesticated, including buffalo, mithan, gayal (refer to Chapter "Gayal–Human Relationships in the Forests of Bangladesh"), saola, and yak. Various wild boars and pigs including bearded pig, buru babirusa, and pygmy hogs live in the area. Regarding birds, wild chickens and cormorants (river cormorants and sea cormorants; refer to Chapter "Adaptive Strategies of Cormorant Fishers in Response to Decreased Fishing Area: A Case Study of Poyang Lake, Jiangxi Province, China") have been domesticated, but swallows are used as well as wild birds for enjoyment of their songs. Moreover, Japanese have lived with Japanese monkeys that inhabit northern areas. Other mammals including monkeys, deer, and bears are studied (Chapters "Changing Mountain Landscapes in Japan: Wild Bear–Human Interactions in the Short Term" and "Undoing Monkey Attraction to the Village: A Food-and-Threat Response to Wildlife Crop-Raiding in Rural Japan"). They were used as medicine in Chinese culture, namely, monkey heads, deer horns, and bear gallbladders. As described above, both wildlife and domesticated creatures have been used for various purposes.

The interactions between humans and animals can be regarded according to the three stages presented above. First, at present, nomadic pig herding is practiced in the Bengal Delta of Bangladesh (Ikeya 2014). The practice requires knowledge of pig food during moving and skills to manage pig herds. Furthermore, human–pig interactions can be considered in historical ecology for the long term. When, where, and how did wild boars become bred into domesticated pigs? That is a theme to be addressed when one considers wild boar domestication (Chapter "Rearing Wild Boar in Okinawa: Thinking About Their Domestication"). The same question can be asked for taro. When, where, and how did humans succeed in domesticating taro (Chapter "Taro (*Colocasia esculenta*) in Asia and the Pacific: Models for Domestication as a Food and Fodder Crop")? A third issue is the relation between nomadic pig herding and modern society. We can assess the sustainable use of resources through pig herding in the Bengal Delta (Ikeya 2014).

Human–Plant: People–Plant Coexistence and People–Plant Conflict

We shall also study human–plant relations in the world by identifying two cases according to whether a plant is useful or harmful for humans. As examples of the former case, people have used wild plants, vegetables, mushrooms, and nuts for food (Ikeya 2003). Trees and bark have been used as construction materials. The sap of lacquer trees has long been used for decoration (Chapter "Comparison of Landscape Transformations in the Japanese Archipelago and the Brazilian Amazon"). As an important example of the latter case, because of deforestation, carbon dioxide is not being adequately taken from the atmosphere, thereby exacerbating global warming.

In Monsoon Asia, people have used various plants more than in any other area. In Japan, various plants have been used for food depending on the season. Japanese people have long collected edible wild plants in spring, and have enjoyed mushrooms and nuts in autumn (Ikeya 2003). Edible wild plants include the fiddlehead fern (*zenmai*), bracken (*warabi*), ostrich fern (*kogomi*), and giant butterbur (*fuki*). Mushrooms include *matsutake*, *maitake*, *shiitake*, *nameko*, and cloud ear (*kikurage*); nuts include chestnuts, horse chestnuts, and walnuts. In addition, plants are often used for decoration in Japan. Cherry trees have been singled out for particular enjoyment of their flowers. *Hanami*, which are parties under cherry blossoms in early spring, are quite popular throughout Japan (Fig. 4).

To Japanese people, the term *Satoyama* conjures up images of idyllic rural landscapes of fields and woodlands (Takeuchi et al. 2003). *Satoyama* in Japan means an ecotone area, i.e., a border area between a village and a forest, usually in mountains near the villages. There, as the number of rural residents decreases, crop raiding by animals including bears and boars is increasing. Sometimes people are attacked too. Forest landscapes in the Amazon are regarded as a cultural product. Whether this view can be generalized to other forest regions of the world will be examined by comparing *Satoyama* and other secondary forests in the world.

Human–plant relations can be examined by adopting the three stages described previously while taking the particular example of *zenmai*. In Japan, people collect *zenmai*. It is necessary to know the ecology of *zenmai* and collect them by devoting attention to their growth (Chapter "Bamboo Culture in Monsoon Asia: From a Case of the Hmong Farmer in Northern Thailand"). Particular skill must be devoted to control groups of *zenmai*. Whether *zenmai* can coexist with urban life is questionable.

Second, human relations with *zenmai* can be considered over a long term. When, where, and how did people start domestication of *zenmai*?

Thirdly, the relation between *zenmai* collection and modern society will be studied. In the Tohoku region, whether *zenmai* collection for commercial purposes is sustainable or not will be questioned. Furthermore, deforestation is a cause of global warming.

Fig. 4 Human–cherry interaction at Osaka, Japan. The scene is known as *Hanami*

Structure of This Book

Contributors to this book have examined human–animal and human–plant interactions in Asian forests (Southeast Asia, southern Asia, and Japan) and inland water areas (China). For comparison, examples of North and South America (Arctic region, Caribbean Sea, Amazon) and tropical Africa (forests in the Congo Basin) are also presented (Fig. 5). This book comprises four parts.

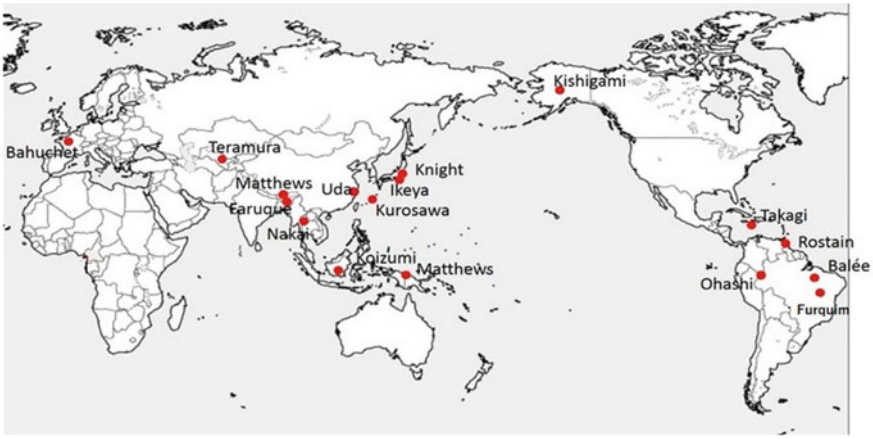

Fig. 5 The study areas in this book

Four theoretical frameworks of human–animal and human–plant interactions in Part I. That is, approaches from historical ecology (Chapters "Comparison of Landscape Transformations in the Japanese Archipelago and the Brazilian Amazon" and ""Back to the Trees!": Historical Ecology in Amazonia"), ethno-ecology (Chapter "Trends for Ethnoecology in the French-Speaking Tropics and Beyond: Origins and Evolution"), and historical geography (Chapter "Changing Mountain Landscapes in Japan: Wild Bear–Human Interactions in the Short Term") introduced. We can understand that unique studies on human–animal and human–plant relationships have been independently developed.

Part II shows contemporary ethnozoology over time in Monsoon Asia. In this part, various examples of human–animal interaction in present Asia are introduced; human relationship with monkeys, boars in Japan, cormorants in China, and gayals in Bangladesh. Each example shows different degree of relationship. Monkeys are regarded as harmful and expelled, boars are tamed, cormorants' breeding is entirely controlled as a domestic fowl, and gayals are partially controlled. By studying these examples, regional characteristics of human–animal relationship in Asia will be understood.

Part III shows contemporary ethnobotany over time in Monsoon Asia. Four examples of human–plant interaction in contemporary Asia are addressed in this part: bamboo forest in Thailand, sago palm in Indonesia, and taro in Asia and in the Pacific Ocean area. Each example has different degree of relationship. Bamboo is partially controlled and sago palm is semi-domesticated. Taro has various relationships from gathering to domestication by humans. By studying these examples, regional characteristics of human–plant relationship in Asia will be understood.

Part IV is about global ethnobiology over time on water and land, in which examples of human–animal and human–plant interaction outside Asia are introduced. We will examine if the relationships between creatures and humans in Asia could also be adapted to the relationships in the America and/or in Africa. Three examples are shown here. First, example of human relationship with Bowhead whales in Alaska and then example with Sea turtles in Nicaragua are explained. They are examples which show history of human relationship with wild animals in the Arctic region and Tropics. Next, historical relationship between humans and natural landscape in Amazonia is explained. The long history of human control, and utilization and semi-domestication of forest products will be addressed. Lastly, agricultural history in the Tropic is described. Utilization of natural resources in plain and floodplain area from the past to the present will be understood.

As described above, the purpose of this book is, by understanding the current state of relationships between humans and other living things (animals and plants) from ethnological and ethnobiological perspective, to clarify the continuity and transformation of their relationships in short and long term through historical ecology. In particular, this book focuses on practices in Monsoon Asia, dealing with countermeasures against damages caused by wildlife, methods for domesticating wildlife, how to interact with semi-wild livestock and cormorant. It mainly introduces how to interact with living things from human side, including collecting and processing of wild plants and the process of commercial production and domestication of them.

At the same time, it addresses commercial utilization of natural resources (animals and plants), utilization and protection of animal resources such as whales and sea turtles, and maintenance of biodiversity and forest management in areas other than Monsoon Asia.

By presenting local culture of Monsoon Asia, which has not been known well so far, this book will help readers to understand how diverse and unique cultural relationships have been developed between humans and other living things in Monsoon Asia from prehistory to the present day. It will also be clarified that locality of culture with living things still exists even in the modernizing civilization.

Suita, Japan
Kazunobu Ikeya
ikeya@minpaku.ac.jp

New Orleans, USA
William Balée
wbalee@tulane.edu

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Contents

Theoretical Frameworks: Comparative Approaches in Historical Perspective

Comparison of Landscape Transformations in the Japanese Archipelago and the Brazilian Amazon 3
William Balée

Trends for Ethnoecology in the French-Speaking Tropics and Beyond: Origins and Evolution 21
Serge Bahuchet and Mathilde Bognon

"Back to the Trees!": Historical Ecology in Amazonia 51
Stéphen Rostain

Changing Mountain Landscapes in Japan: Wild Bear–Human Interactions in the Short Term 75
Kazunobu Ikeya

Ethnozoology Over Time in Monsoon Asia

Undoing Monkey Attraction to the Village: A Food-and-Threat Response to Wildlife Crop-Raiding in Rural Japan 91
John Knight

Rearing Wild Boar in Okinawa: Thinking About Their Domestication 105
Yaetsu Kurosawa

Adaptive Strategies of Cormorant Fishers in Response to Decreased Fishing Area: A Case Study of Poyang Lake, Jiangxi Province, China 119
Shuhei Uda

Gayal–Human Relationships in the Forests of Bangladesh 137
M. O. Faruque, M. F. Rahaman, A. Omar, Mohammad Kamrul Islam, J. L. Han, T. Torji, K. Ikeya, and T. Amano

Ethnobotany Over Time in Monsoon Asia

Bamboo Culture in Monsoon Asia: From a Case of the Hmong Farmer in Northern Thailand 151
Shinsuke Nakai

Use and Knowledge of Sago Palms in Borneo: A Case of the Penan Hunter-Gatherers 169
Miyako Koizumi

Taro (*Colocasia esculenta*) in Asia and the Pacific: Models for Domestication as a Food and Fodder Crop 183
Peter J. Matthews

Indigenous History and Global Ethnobiology on Water and Land

Historical Changes in Human Relationships with Whales: Historical Ecology of Iñupiat and Bowhead Whales in Alaska, USA 209
Nobuhiro Kishigami

Historical Ecology of Sea Turtle Fishing by the Indigenous Lowland Peoples of Eastern Nicaragua: A 40-Year Record 223
Hitoshi Takagi

Sweet Cassava, Bananas and Plantains in the Peruvian Amazon: Shipibo Cultivation Methods on the Floodplains 241
Mariko Ohashi

The Constructed Biodiversity, Forest Management and Use of Fire in Ancient Amazon: An Archaeological Testimony on the Last 14,000 Years of Indigenous History 259
Laura P. Furquim, Eduardo G. Neves, Myrtle P. Shock, and Jennifer Watling

Relations Between People, Water, and Domestic Animals in an Ancient Oasis City 283
Hirofumi Teramura

Index 303

Contributors

T. Amano Faculty of Animal Health Technology, Yamazaki Gakuen University, Hachiouji, Tokyo, Japan

Serge Bahuchet Muséum National d'Histoire Naturelle, Paris, France

William Balée Tulane University, New Orleans, LA, USA

Mathilde Bognon Muséum National d'Histoire Naturelle, Paris, France

M. O. Faruque Department of Animal Breeding and Genetics, Bangladesh Agricultural University, Mymensingh, Bangladesh

Laura P. Furquim Laboratory of Tropical Archaeology, Museum of Archaeology and Ethnology, University of São Paulo, São Paulo, Brazil

J. L. Han Institute of Animal Science, Chinese Academy of Agricultural Sciences, Haidian, Beijing, PR China

Kazunobu Ikeya National Museum of Ethnology, Osaka, Japan

Mohammad Kamrul Islam Department of Livestock Services, Upazila Livestock Officer, Bhairab, Bangladesh

Nobuhiro Kishigami National Museum of Ethnology, Osaka, Japan

John Knight Queen's University Belfast, Belfast, UK

Miyako Koizumi Kyoto, Japan

Yaetsu Kurosawa Tokyo University of Agriculture, Tokyo, Japan

Peter J. Matthews National Museum of Ethnology, Osaka, Japan

Shinsuke Nakai Saga University, Saga, Japan

Eduardo G. Neves Laboratory of Tropical Archaeology, Museum of Archaeology and Ethnology, University of São Paulo, São Paulo, Brazil

Mariko Ohashi Japan Society for the Promotion of Science, Kyoto University, Kyoto, Japan

A. Omar Department of Animal Breeding and Genetics, Bangladesh Agricultural University, Mymensingh, Bangladesh

M. F. Rahaman Department of Animal Breeding and Genetics, Bangladesh Agricultural University, Mymensingh, Bangladesh

Stéphen Rostain National Centre for Scientific Research (CNRS), Paris, France

Myrtle P. Shock Archaeology Department, Institute for the Science of Society, Federal University of Western Pará, Santarém, Brazil

Hitoshi Takagi Ocean Nexus Program at Washington University, Seattle, Washington, USA

Hirofumi Teramura National Museum of Ethnology, Osaka, Japan

T. Torji International Centre for Integrated Mountain Development, Khumaltar, Lalitpur, Kathmandu, Nepal

Shuhei Uda National Museum of Ethnology, Osaka, Japan

Jennifer Watling Laboratory of Tropical Archaeology, Museum of Archaeology and Ethnology, University of São Paulo, São Paulo, Brazil;
Laboratory of Microarchaeology, Museum of Archaeology and Ethnology, University of São Paulo, São Paulo, Brazil

Theoretical Frameworks: Comparative Approaches in Historical Perspective

Comparison of Landscape Transformations in the Japanese Archipelago and the Brazilian Amazon

William Balée

1 Introduction

Japanese society *qua* Japanese begins with the archaeological culture called Yayoi. Yayoi is based on intensive agriculture, specifically irrigated rice paddy agriculture. It coincides with the ranked societies of the Kansai region that eventually gave rise to the Kofun Period in the early centuries of the first millennium AD and finally the ancient state (Mizoguchi 2017), which led to the establishment of the longest reigning imperial dynasty in history. Amazonian societies are not as monolithic, partly because they are continental, as opposed to insular, and also because ongoing developments were completely interrupted by the European conquest of the Americas. If they ever developed states, such states seem never to be clearly definable by ethnographic analogy or by comparison with other archaeological states in the world, because from the little known about the peoples' social and political organization, states have not been seen or documented—where there was writing—and they have not existed at all since 1492, or more specifically 1541–42, when Francisco de Orellana navigated the length of the Amazon River from west to east initially in search of spices. The peoples were largely wiped out by disease after that, and hardly any of this is recorded during the rest of the sixteenth century. In contrast, early Chinese writers in the *Book of Songs* wrote of chiefly successions of the Middle Kofun Period (ca. fourth century AD) in the Kansai area (Mizoguchi 2017, 590), before Japanese calligraphers are recording history themselves. Writing arrived in Japan before the end of the first millennium with *haiku* poetry, but Amazonia would be written about only by outsiders, and there is really only a trickle of documents between Orellana's visit and the start of the seventeenth century. History for Amazonia is embedded archaeologically and to some extent in what one can ascertain about social organization and landscape realities via historical linguistics.

W. Balée (✉)
Tulane University, New Orleans, LA 70119, USA
e-mail: wbalee@tulane.edu

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As to settlement hierarchies, whereas early Japanese urban centers like Nara and Kyoto took the form of dense concentrations of wooden and bamboo structures, surrounded by countryside, Amazonian prehistoric agglomerations might have been zones of low density urbanism (Prümers et al. 2022) or garden cities (Heckenberger et al. 2003, 2008), with rings of urban concentration surrounded by forests that were in turn girdled by human settlements in a concentric form. No cities in Asia or Europe nor any other urban concentrations in the Americas (such as the Valley of Mexico, the Bolivian Altiplano, the Desert Coast, and the Cuzco region) exhibit similar forms, though each has peculiarities not found in any of the other cases. It can be argued nevertheless that some kind of ranking at the least can be detected in the urban and quasi-urban centers of Santarém in the Lower Amazon and surroundings, the Upper Xingu catchment, Marajó Island at mouths of the Amazon River and the surrounding deltaic plain, and the Central Amazon near the conjunction of the Solimões and Negro rivers, Brazilian Amazon. These would have had to be accompanied by mobilized and regulated labor in order to build and maintain the earthworks, such as occupation mounds, causeways, reservoirs, and intensively cultivated fields of *terra mulata*1) that represent the physical signature of ancient complex societies. The antiquity of complex society may be as old in Amazonia as in Japan, incidentally, but its prehistory lasts much longer because of the tardiness of written records. Whereas Japanese haiku poetry dates from the tenth century (close in time to the establishment of an imperial line), outright literary representations of Amazonia—which can be sourced for evidence of complexity—can indeed be found only after Orellana.

Rather than search for evidence of socioeconomic stratification—a clear affirmative in the Japanese case, and perhaps a question mark in the Amazonian one—perhaps a more fruitful line of comparison, if one is looking for cultural convergences, is to examine whether *hierarchy* permeates the physical (archaeological) remains and indeed whether it can be detected in the most imposing of all such possible vestiges of the past, namely, the landscape itself. That is the more encompassing level of empirical, material reality that could be subjected to the same method of historical ecology in order to be rendered intelligibly and logically as being similar or not.

2 Defining Hierarchy

At the outset, one is obliged to admit that "hierarchy" is an arbitrary term used to denote aesthetic or spiritual elaboration of objects, both mental and material, above and beyond any functionality or utility the objects might possess. As such, the concept as used here is embedded in cultural industries (Hirsch 2000), but it is more than that. Every culture has hierarchy, as with the general-purpose classifications of animals and plants. A mental hierarchy is seen for example in the worldwide existence of folk taxonomies that classify plants and animals in five or more ranks, specifically, in nested hierarchies (Berlin 1992; Brown 1984; cf. Ingold 2014; Howell 1985). Although "hegemony" is one of Raymond Williams's (1983, 144–145) "keywords", perhaps because of its association with nineteenth century colonial society, and has

a clear meaning in political terms, hierarchy can be extended outside the societal realm, whereas hegemony cannot, and can refer to differential aesthetic or spiritual properties of material objects and forms, which can be living or not. "Hegemony" denotes only living, specifically human or anthropocentric (as with the hegemony of male silverbacks in gorilla families or alpha females in howler monkey troops) phenomena. Hierarchy in the material world for my purpose here references the added labor affixed to objects for the accomplishment of non-utilitarian yet canonical ends. Hierarchy of production of commodities—this seen as contributing to the Platonic sense of "the good" as fashioned by humans—can be seen where standardization of a form has become institutionalized and rule-governed. It needs to be studied carefully because it is found not only in complex societies, but also in egalitarian ones. An empirical approach is needed, along the lines of Franz Boas' historical particularism—the idea that one cannot assess cultural similarities and differences until cultures are thoroughly documented from their known beginnings to the present–, to detect it; ethnographers were long ago reminded that "Boas raised field work to an entirely new level by demanding that the ethnographer's technique must equal that of a student of Chinese, Greek, or Islamic civilization" (Lowie 1937, 132). A commitment to empiricism and removal of stage-theory blindfolds about social stratification and its stepwise development are a precondition for understanding the meaning of hierarchy.

Hierarchy may or may not require hegemonic (or stratified) social organization on a permanent basis to manifest itself, though it probably is cyclically or temporarily the case because massive amounts of labor cannot be organized without leadership and even centralization of some kind. Hocart observed of Fiji in 1936 that "there is no government, in our sense of the word …," but governing occurs if needed, and as such, the "machinery of government" precedes its realization (Hocart 1970, 31). But the *modus operandi* of the governing organization need not be clothed in imperial or elite authority. Hierarchy can exist, in other words, independent of persons. When medieval kings of England died, there was no interregnum—as there are today in many monarchies—since "there is a king all the time, the dead king … He reigns, but does not govern …," until his successor is crowned (Hocart 1970, 135). The hierarchical format might have originated in a fiction of egalitarianism, while being in reality hierarchical itself. This standardized kind of hierarchy can precede genuine stratification of society itself; standardization from the point of view of modernist architecture is, moreover, an "immediate prerequisite" of civilization (Gropius 1936, 241).

Hierarchy can be seen in seemingly mundane objects (like bowls and baskets) and it can exist on the genuinely vast plane of landscapes, including the architecture one can find thereupon. The Chumash of the Santa Barbara, California, area, who were the first aboriginal Californian society known to Europeans (in 1542–43) had rank, not stratification, in the definition of social status, yet some of their commodities (or cultural industries) evinced hierarchy, especially basketry (Kroeber 1925, 561). Perhaps for that reason, the Spaniards considered the Chumash to be "superior" to other Californian peoples (Kroeber 1925, 550). Basketry throughout aboriginal California could be elaborate and was sought by European curio collectors; in particular,

baskets made by coiling (as opposed to twining), wherein spiral warp rods were woven together with elastic weft material, were sometimes interwoven with feathers and used as gifts or ceremonial baskets, as with the Northern Pomo of Mendocino County (Welch 2013, 152). The Chumash stand out even among other Californian groups probably because of thread count in their basketry weaving. Thread count is an indicator of a notion of usage or viewing by a critical audience that transcends utilitarianism. The thread count of "showpiece" Chumash baskets (Kroeber 1925, 501) ranged between 225 and 360 stitches per square inch (35–56 cm^2) (Timbrook 2014). Apart from the design, artwork, and raw materials manipulated in making the basket, the thread count alone testifies to a concept of hierarchy—it is an abstract conceptual division of things that lies above and beyond the utility of the object as representing a class of mundane, utilitarian wickerwork.

It could be at the societal position that hierarchy is mostly comprehended empirically among groups who are either ranked or stratified into classes or castes. Aboriginal Californian societies including the Chumash are known as having been complex, ranked societies (even though they were technically hunter-gatherers), and are often written about together with Northwest Coast societies for that reason; and here, the Ainu of Hokkaido are probably similar (Hudson 2017). Among the Chumash, "rank was carefully regulated", and chiefs not only commanded respect but also practiced polygyny (Kroeber 1925, 556). That is not incongruent with hierarchical engineering, architectural, or other manifestations of human agency in the *transformation* of objects, be these domestic or landscape-scale objects.

3 Agentive Transformations of Things

Hierarchy in an object indicates its susceptibility to nuance and design, and design at its most extreme end involves transformation. The object transcends its base, original, material form and becomes something else, a standardized cultural industry. Landscape transformation is the historical-ecological replacement of ecological succession, for it includes human agency in the successional seres that a landform undergoes. "Landscape", in English and other Indo-European languages, is translatable as *satoyama* in Japanese. In particular, *satoyama* as the intersection of village and forest bespeaks the agency of culture in reordering the landscape. The landscape (and related -scapes such as seascapes and riverscapes) are key concepts in historical ecology and are mutually translatable into Japanese, with potentially similar applications. In such manner, the circular patterns, sometimes concentric circles, of Gê villages in Central Brazil (introduced evidently by Arawakan-speaking peoples by about AD 1000–Heckenberger et al. 2003, 2008) logically defy their earlier, cultural-ecological classification as "marginals" (Lévi-Strauss 1969, 9). Advanced technology and engineering with hierarchical design features can facilitate complexity of society regardless of initial socioeconomic conditions.

Hierarchy is attained by integration of different functions and elaborations of aesthetic detail when one is discussing objects, whether animate or inanimate. The

Fig. 1 Nagahama Bonsai Exhibit, January 2017. *Photo* William Balée

functions of a living plant that is not necessarily domesticated as a species, and that is subjected to long-term, standardized pruning for its ability to produce beautiful flowers, as in bonsai, combines biology with art. The names of bonsai plants in addition suggest that the art is more than bringing beauty to fruition; it is *otaku* (knowledge of some specialty) that seeks to link different parts of the material world into an aesthetic union. It is not a craft nor is it an art alone. It is synesthetic, and quite deliberately so. One can note this phenomenon, for example, in names of individual specimens that were on display at the January 2017 bonsai exhibit in Nagahama, such as "Color of Sound" and "Flower in the Wind" (Fig. 1).

The "small garden for looking" (*tsuboniwa*), but not strolling, represents a continuing expansion of the meticulous attention paid to the hierarchy of culture and nature and the synesthesia associated with this sequence (Fig. 2). Standardization applies to it; indeed, the design principle underlying the *tsuboniwa* is that it is to be maintained into perpetuity. Its maintenance is dependent on secondary landscape transformation type II (see Sect. 5), which keeps it holding fast to tradition, just as Japanese lacquer artists of the twentieth century sought to do by trying to replicate tradition, not to create new forms (NMMA 1982). The looking garden in Japan in its origin is an example of primary landscape transformation type II, as a complete transformation maximizing plenitude, and arresting it—in real or imagined fashion—for aesthetic, spiritual, and traditionalist purposes. This kind of transformation is dependent on a concept of hierarchy, one that transcends the culture/nature dichotomy.

Hierarchy is seen in a variety of objects that are masked as to their symbolic meaning. If in modern communication the medium is the message (McLuhan 1994), in traditional Japanese "prestations" (e.g., obligations to a landlord), the packaging could be the gift. Standardization of transformed functionality is seen in packaging. Traditional Japanese packaging might contain utilitarian items like food, sweets, incense, dried fruit (Oka 1967, 15), but the packaging involves three-dimensional art and beyond that may include calligraphy, painting, and other enhancing features that transform the package as container into something hierarchically more important.

Fig. 2 Japanese garden (Tsuruoka). *Photo* Kazunobu Ikeya

The transformation of utilitarian objects by what are seen as mundane crafts but which are by design synesthetic art—Japanese packaging, Chumash basketry—have analogues in historical ecology, namely in landscape transformation. One can ascertain hierarchy in the sense appropriate to historical ecology where one can observe qualitative differences of human agency in the environment. In terms of sheer monumentality, the geoglyphs or ditched enclosures of Acre (Pärssinen et al. 2020; Watling et al. 2018; Saunaloma and Schaan 2012)—in some cases up to 35 000 m^2 in size, with the longest sides of rectangles measuring ca. 200 m—are comparable to the tumuli of the Kinki region in Japan. The functions are different—the geoglyphs were probably built for living ceremonial purposes, whereas the tumuli are mortuary monuments. But the time frame is similar (first millennium AD; Schaan et al. 2012; Mizoguchi 2017), and both landscapes are associated with agricultural (or Formative, in the Amazonianist terminology) peoples. More important, these gigantic earthworks in both cases had long-term effects on the environment, changing the previous species composition and perhaps even enhancing its diversity (Balée et al. 2014; Watling et al. 2018).

Finally, one can point to the complete transformation of utilitarian objects that, for the purpose of illustrating the standardization of hierarchy in objects in both Amazonia and Japan, can be adduced. Traditional Japanese lacquerware is exhibited in the outward form of writing boxes, writing-paper boxes, bento boxes, incense containers, trays for clothing, cosmetics boxes, tea ceremony water jars, containers for sweets, writing stands, cabinets, and small tables. In Japanese, lacquer is called *urushi* and the process of lacquering is *kyūshitsu* (NMMA 1982, 296). Lacquerware