

[Keynote Address]

Cosmovision and Co-evolution of Bio-cultural Systems and Crop Diversity in Agrarian Landscapes: Consolidating an Alternative Paradigm for Agriculture and Conservation

EYZAGUIRRE, Pablo, MORIMOTO Yasuyuki and OUDENHOVEN, Frederik VAN

Biodiversity International, Rome, Italy

EYZAGUIRRE, Pablo is a senior scientist in the Diversity for Livelihoods Programme at Biodiversity International. A citizen of Chile, Eyzaguirre received his Ph.D. in anthropology (1986, Yale University) and is a specialist in social and ecological anthropology, tropical farming systems, ethnobotany, and agrarian institutions. He has worked in all major regions of the world, and has published widely on culture and environment in agrarian societies, home gardens, ethnobotany, nutrition, agricultural research and natural resource management in developing countries. He is the author of *Agricultural and Environmental Research in Small Countries* (John Wiley & Sons, 1996), *Home Gardens and Agrobiodiversity* (co-edited with O. Linares, Smithsonian, 2004), and numerous other works. Most recently he has been leading global research initiatives that investigate the links between the agricultural biodiversity and healthy food systems across cultures; working with conservation biologists to integrate agricultural biodiversity and sustainable livelihoods in the management of protected areas; and working with the International Council for Science (ICSU) to design a global research programme on ecosystem services and human well-being.

Abstract: The paper discusses examples where crop domestication is an on-going process taking place in agricultural systems that maintain high levels of biodiversity. These systems are characterised by social and ecosystem interactions that are embedded in unique cultures and cosmologies; they guide and imbue the domestication process and the management of agrarian landscapes with a range of spiritual, cultural, economic and regulatory values. The crop domestication process typically occurs within mosaic landscapes including both wild and cultivated components. Thus we consider the presence and extent of wild areas as anthropogenic as they support and enrich the cultivated areas, as they in turn buffer and protect the wild landscape.

The paper reviews three approaches to bio-cultural agrarian landscapes beginning with early transdisciplinary research concerned with social change, governance, and food production, exemplified by Audrey Richards, *Land Labour, and Diet in Northern Rhodesia* (1939), Max Gluckman, *The Economy of the Central Barotse Plain* (1941), and Pierre de Schlippe, *Shifting Cultivation in Africa, The Zande system of agriculture* (1956). Second, it covers more recent research on the unique and specialised agroecological knowledge of indigenous cultures known as ethnoscience that places agriculture within a traditional society's cosmovision of the natural world. We note the work of Harold Conklin, *Hamunoo Agriculture* (1957) and the *Ethnographic Atlas of Ifugao* (1980) and Prof. Sadao Sakamoto's work that linked culture to the evolution crop gene pools in rice and tropical root crops. The third element of biocultural research reflects the concern with poverty and marginalisation of rural communities. Agricultural development often ignored the resources that communities developed for their livelihoods and the rules for managing them, (e.g. local crops such as quinoa, fonio, ensete, gourds, roots and tubers, gathered foods, and the use of local crop varieties). *In situ* conservation and documentation seek to maintain crop land races and related resources and knowledge in traditional farming systems. However such systems are under threat due to cultural and demographic change, marginalisation and poverty. The paper presents methods to address the bases and underlying threats to farming communities in areas rich in biodiversity, and ways to support the cultural innovation and ecological adaptation that typifies the more resilient and intact biocultural landscapes.

Research and support for co-evolutionary processes focuses on mosaic landscapes that bring together spiritual, biological and productive components. Such landscapes provide the basis for continuing crop domestication, ecological adaptation and cultural innovation. The paper presents cases from Cuban agriculture in neo-tropical forest reserves, Sahelian horticultural gardens, East African crop domestication and intensification of biodiversity to cope with climate change, and the revival of traditional fruit orchards at the cultivated and wild interface in Central Asia. The development of indicators that can be applied across landscapes and cultures will allow us to synthesise and understand the factors that underpin the resilience and resurgence of bio-cultural landscapes; and used to identify a range of strategies and options that promote community well-being and cohesion for future generations in these areas.

Keywords: biocultural landscapes; crop domestication; marginalisation; local crops; mosaic landscapes; biodiversity; agriculture, rural communities; resilience, innovation

[Keynote Address]

Conservation and Adaptive Management of Globally Important Agricultural Heritage Systems (GIAHS)

KOOHAFKAN, Parviz

FAO, Rome, Italy

KOOHAFKAN, Parviz is the Director of FAO's Land and Water Division, Natural Resources and Environment Management Department, and the pioneer and coordinator of the U.N. Partnership Initiative on "Conservation and Adaptive Management of Globally Important Agricultural Heritage Systems (GIAHS)". He was formerly a Director of FAO's Climate Change and Bio-energy Division and its Rural Development Division. He held several other senior positions in FAO headquarters and the Latin American and Caribbean country offices. He earlier held assistant professorships in applied ecology at the Ecole Nationale du Genie Rural des Eaux et Forêts and in pastoral management at the University of Orumieh in Iran. M. Koohafkan has a PhD. in terrestrial ecology, a master's degree in general and applied ecology both from the University of Sciences and Techniques of Montpellier, France, and an engineering degree in agronomy and natural resources management from the University of Teheran, Iran. His most recent book is "Enduring Farms: Climate Change, Smallholders and Traditional Farming Communities", co-authored by Professor Miguel Altieri (U.C. Berkeley), published in 2009 by the Third World Network.

Abstract

Worldwide, specific agricultural systems and landscapes have been created, shaped and maintained by generations of farmers and herders based on diverse natural resources, using locally adapted management practices. Building on local knowledge and experience, these ingenious agri-cultural systems reflect the evolution of humankind, the diversity of its knowledge and its profound relationship with nature. These systems have resulted in the maintenance and adaptation of globally significant agricultural biodiversity, outstanding landscapes, indigenous knowledge systems and resilient ecosystems, but above all, in the sustained provision of multiple goods and services, food and livelihood security for millions of poor and small farmers. Following several years of field work and consultations with member countries and national and international institutions, FAO launched a Partnership Initiative on Conservation and Adaptive Management of Globally Important Agricultural Heritage Systems (GIAHS) at the World Summit on Sustainable Development, Johannesburg 2002. GIAHS Initiative seeks to promote their international and national recognition and dynamic conservation - including where necessary the revitalization of agricultural heritage systems and their key elements. This presentation describes several sample agricultural heritage systems, the criteria used in their evaluation, and the key challenges the GIAHS initiative confronts in establishing between 100-150 Globally Important Agricultural Heritage Systems.

Keywords: Globally Important Agricultural Heritage Systems; agricultural biodiversity; dynamic conservation; adaptive management; food security

Towards the East Asian Landscape Convention: Nurturing Diversity via the Protection of Everyday Life-Worlds

LINDSTRÖM, Kati

University of Tartu, Tartu, Estonia

LINDSTRÖM, Kati is a researcher in the Institute of Philosophy and Semiotics in the University of Tartu (Tartu, Estonia). She received her MA in Semiotics and Theory of Culture in the University of Tartu (2003) and attended the PhD course at the University of Kyoto (2004-2006). From 2005 to 2007 she worked for RIHN as a founding and core member of the Modernisation and Neolithisation: Landscape History on East Asian Inland Seas Project. Her major fields of interest are Landscape studies, human geography and the semiotics of culture. Some of her recent publications include: "Landscape and History: Towards a New Understanding of Environmental Issues" in Lindström and Uchiyama eds.; "Versatile Waterfronts, Landscape History and Environment on the east Asian Inland Seas I" (2010, in Japanese); "Autocommunication and Perceptual Markers in Landscape: Japanese Examples" in Biosemiotics (2010); and "From Experiential to Chronometric Seasonality – the Establishment of Seasons as a National Symbol in Modern Japan" in Palang, Hannes; Sooväli, Helen; Printsmann, Anu eds., *Seasonal Landscapes* (2007). *kati.lindstrom@ut.ee*

Abstract

Landscape is the stage of everyday life: the arena where cultural and natural processes merge and create the whole realm what is known to us as environment. While in many classical earlier nature protection programs the humans and „nature“ are conceived of the two as opposite phenomena, the former of which exerts almost invariably negative impact on the latter, then recent research in environmental history and archaeology has demonstrated that all existing landscapes have in a smaller or larger degree been shaped by human activity. Even areas such as the Amazon, which have been earlier called Lungs of the Earth and were considered pristine and untouched natural areas, are actually deeply anthropogenic landscapes whose present shape has been greatly influenced by the everyday life of its former inhabitants. Thus, even though the everyday life of modern humans in the so-called First World countries is the source of most environmental issues we know today, the everyday life of human communities is historically deeply connected to the natural environments that are famous for their biodiversity. It would therefore not be correct to exclude human activity from protected areas, instead we should learn to support and/or recreate everyday activities that have been shaping the landscape and given it its present form. Council of Europe has realised the crucial role that landscape, uniting both “natural” and “cultural” realms and staging everyday human activities, plays in protection, management and planning activities and has adopted the Landscape Convention already back in 2000. The present paper argues that East Asia could also benefit from passing a similar landscape convention for a better protection, management and planning of East-Asian landscapes with a due respect for its natural and cultural diversity.

Keywords: landscape; European Landscape Convention; landscape protection; ecohistory; East Asian inland seas

Torrents of Diversity: the Future of the Past in Riverine Landscapes

KANER, Simon

Sainsbury Institute for the Study of Japanese Arts and Cultures, Norwich, UK

KANER, Simon is an assistant director at Sainsbury Institute for the Study of Japanese Arts and Cultures in United Kingdom. He received his PhD. in archaeology from the University of Cambridge (2004). He was a research associate at Kyoto University (1991-1993) and senior Archaeologist at County Archaeology Office, Cambridgeshire County Council (1998-2001). His major publications include: "Tatsuo Kobayashi Jomon Reflections" (Translated, adapted and edited with Oki NAKAMURA); "Long-term innovation: the appearance and spread of pottery in the Japanese archipelago" in Peter Jordan and Marek Zvelebil eds.; and "Ceramics before Farming: the Dispersal of Pottery among Prehistoric Eurasian Hunter-gatherers" (2010). His major field is archaeology in Japanese archipelago, and directed the Shinano River Project (2004-2009, funded by the British Academy). He has led exhibitions for Japanese prehistory in UK involving Japanese, American and European colleagues: *Unearthed: Figure-making and Figure-breaking in Ancient Japan and the Balkans* (Sainsbury Centre for Visual Arts, Norwich, 2010) and *The Power of Dogu: Ceramic Figures from Ancient Japan* (British Museum, London, 2009). s.kaner@sainsbury-institute.org

Abstract

The great majority of Japanese rivers have been canalised, dammed and re-routed or otherwise 'domesticated'. The anthropologist Veronica Strang has studied the ways in which 'water' and 'rivers' are culturally constructed and given meaning by societies around the world. In this presentation I will consider how riverine landscapes are 'managed' in the 21st century, and look back at how meaning may have been given to these critical components of landscape in historic times ('modernisation') and prehistory ('neolithic'). Two comparative case studies will be presented. The first is the Shinano River in central Honshu (which is close to the area studied by the Hokuriku Working Group). I analyse the contents of the journal 'Shinano' to assess the perception of this, the longest river in Japan. The second is drawn from the study area of the European Working Group, the River Ouse in the east of England. Here I look at the work of the Fenland Survey and the study of the inundated landscapes of the North Sea, into which the Ouse debouches. Both rivers and their catchments are expected to undergo very significant changes as a result of climate change, and I will conclude by considering the impact that riverine landscape management strategies in the UK and Japan may have on landscape diversity.

Keywords: landscape domestication; landscape diversity; management impact; River Ouse; riverine landscapes; Shinano River

A Historical Perspective for Mountainous Landscape in Hida, Central Japan

KOYAMA Shuzo

Research Institute for Humanity and Nature, Kyoto, Japan

KOYAMA Shuzo is a guest professor at RIHN (2010-) and the Director General at Suita city museum in Osaka, Japan (2004-). He received his PhD. in University of California, Los Angeles (1976). From 1976 to 2000, He worked at National Museum of Ethnology as an associate professor (1976-1990) and a professor (1991-2000), and was installed as a professor emeritus from 2004. His recent publications include: "Slash-and-burn in the Jomon Period: a Viewpoint from Hunter-gatherer" in *Quarterly Journal of Tohoku Studies* vol. 2 (2005); and "The Technology of Fire: from Hunter-gatherers to Farmers" in Takashi Kurata and Yoichiro Sato eds., *History of Agriculture in Eurasia* (2010). His major fields are ethnology and archaeology, and he is a pioneer of quantitative analysis using computer for ethnology and archaeology in Japan. In 1981, the database of Hidagofudoki started operating at National Museum of Ethnology as an information retrieval and mapping system for foodstuffs. He is also committed to outreach activities, such as citizen participation for museum management and education program for the visually impaired. skoyama@idc.minpaku.ac.jp

Abstract

Conflagrations always give tremendous impacts to biomass of local environments and alter landscapes. In our time, firing is considered dangerous for citizen's lives and property and a cause of environment problems, such as air pollution and global warming. The technology of fire, however, made it possible for humans to make artificial landscape, such as forests and grasslands, since the early stage of history. In this paper I would like to introduce ethnological and historical examples of fire from slash-and-burn agriculture in Japan comparing with grassland-burning by the Aborigine people in Australia, and then provides a historical perspective of fire technology in creating landscapes.

Slash- and-burn agriculture was popular in Japan until 1960's, especially in mountainous area. In 1936, one hundred fifty thousand households managed a total of eight million square kilometer burnt field. The Hida region is an administrative unit before the Meiji period, located in the northern part of present Gifu prefecture. "Hidagofudoki (A New Geographical Description and History of Hida)" was published in 1873. It contains detailed records of products from the mid 19th century, before the industrialization of Japan. There were 415 villages, from which 455 products are listed, often with quantitative data: cultivated crops, wild food stuffs, craft products, and other miscellanea, as well as data on population, households, temples and shrines. The Hida was an active region with slash-and-burn, and cultivations of millets are recorded in 403 villages.

It also discusses a recent tendency of attempting to revitalise "traditional" mountain-burning that is widely seen in Japan such as Mt. Wakakusa in Nara. These attempts are conducted not only in the name of restoring sustainable ways of life in the past, but also aiming to create attractive tourist resources.

Keywords: Hida region; historical perspective; mountain-burning; mountainous landscape; slash-and-burn agriculture; technology of fire

Making Alternative Landscape with Local Feelings

- A Case of *Silsangsa* Buddhist Temple and People -

CHO, Kyoung-Mann

Department of Cultural Anthropology, Mokpo National University, Mu-an-gun, Korea

CHO, Kyoung-Mann has taught as a professor at the Department of Cultural Anthropology, Mokpo National University, Korea (1990-present). He received his Ph.D. from Seoul National University (1997). His main areas of interest are ecological anthropology on the southwestern marine & forest villagers in Korea and First Nation peoples in pacific coasts of Canada. Presently he serves at the UNESCO-MAB Korea and Asian committee of MOA (Museum of Anthropology, UBC, Canada). He is executing a 'Research on the System of Traditional knowledge related to Village Woodlands' (funded by National Research Foundation, Korea) in Jiri Mountain villages of Korea and in Clayoquot Sound villages of Canada. His recent publications include: "A Consideration on the People's Conceptualization of Tidal Flat and Human Life" in *Journal of Island Culture* 32 (2009); "Spatial Change of Mokpo City and Cultural Processes since its' Open Port" in *Researches in Incheon Studies* 10(2009); and *Asian Eco-culture* (Ministry of Culture, Sports and Tourism; 2009, co-author). chkm1@paran.com

Abstract

Korean rural, local landscapes have been in 'generalized' degradation processes due to the Korean War, rapid modernization mainly depending on the industrialization ideology, disordered generalization or uniformity of construction. As a consequence cultural diversity of landscape depending on the adaptation to topographical, ecological diversity has been diminishing. In traditional sector too, like buddhist temples, ancestor tombs and shrines, a kind of megalomaniac images of space and monument have prevailed. Recently there have been retrospects and reconsideration on the disordered generalization which has infringed upon the diversity of landscape and culture. Ecological thought and movement of Silsangsa Buddhist temple located in Jiri Mountains, southern part of Korea, intellectuals' participation in the movement and villagers' reflexive discourses represent contemporary reactions to Korean generalized degradation processes. It is not only the reaction to the trends of excessive Buddhist architecture and monuments. People have tried to make representative transformation of culture from that of generalized landscape degradation to that of concretely living place with interacting people's feeling and ecosystem. It is an emergent, alternative reaction transcending revitalization of past.

Keywords: alternative reaction; cultural diversity; ecological diversity; generalized degradation; landscape; local feeling

Before Monoculture: Archaeogenetics and the Diverse Field

JONES, Martin K.

Department of Archaeology, University of Cambridge, Cambridge, UK

JONES, Martin K. is a George Pitt-Rivers professor for archaeological sciences at the Department of Archaeology, University of Cambridge. He received his D.Phil. in “*The ecological and cultural implications of selected carbonised seed assemblages from southern Britain*” from the University of Oxford (1985) and a Ph.D. in incorporation from the University of Cambridge (1991). He was an environmental specialist at the Oxford Archaeological Unit (1974-76 & 1977-79), an archaeobotanical research assistant at the Institute of Archaeology and Botany School, University of Oxford (1979-81), a lecturer in archaeological science at the University of Durham (1981-89), and a senior lecturer in archaeological science and a Chairman of the Centre for the Evolution of Human Environments, University of Durham (1989-90). His current research interests are: food and foodways; cold climate ecology and pre-agricultural use of plant foods (current focus on Dolni Vestonice and the Moravian Gate, new collaboration with the Baikal Archaeology Project); Early crops through bio-archaeology and genetics (current focus on *Triticum dicocum*, *Hordeum vulgare* and *Panicum miliaceum*); and later prehistoric and early historic agriculture. His major publications include: *Feast: why humans share food*, Oxford University Press (2007); *Archaeology Meets Science: Biomolecular and Site Investigations in Bronze Age Greece*, Oxford: Oxbow books (co-written with H. Martlew and K. Tsedakis) (2008); “Moving North: Archaeobotanical Evidence for Plant Diet in Middle and Upper Paleolithic Europe” in J-J. Hublin & M.P. Richards (eds.); and *The Evolution of Hominin Diets: Integrating Approaches to the Study of Palaeolithic Subsistence*, Springer Netherlands (2009).
mkjl2@cam.ac.uk

Abstract

The transition to agriculture has often been viewed as a revolution in resource diversity. Before the transition, a considerable range of biological resources was foraged, gathered and hunted. After the transition, the resource base dwindles to a handful of species, typically raised singly within bounded plots. While this opposition broadly resonates with major trends in the human food web during the Holocene, it obscures the diversity of Neolithic food economies, raised within ecosystems for which modern analogues are scarce. This diversity is evident from a number of sources, including archaeobotany, ethnographic observations and genetics. This paper reviews how the interface between genetics and archaeology in the study of early agriculture may reveal different aspects of early biocultural diversity.

Attention will be paid to a series cereal species that are predominantly self-pollinated. In monocultural stands, genetic diversity in such cereals would be expected to diminish in a relatively small number of generations. Persistence of or increase in genetic diversity begs questions of how such diversity was maintained. The young field of ‘archaeogenetics’ has moved from simply charting phylogenetic pathways in relation to specific non-coding regions, both to examining coding genes and the dynamics of past populations. This paper will review some of the progress,, potential and problems in growing area of research.

Keywords: archaeogenetics; archaeobotany; landrace; early agriculture

Cattle Biodiversity in Past and Present in South to East Asia

MANNEN Hideyuki

Laboratory of Animal Breeding and Genetics, Graduate School of Agricultural Science, Kobe University, Kobe, Japan

MANNEN Hideyuki is a professor at the Graduate School of Agricultural Science, Kobe University. He received his PhD from the Graduate School of Agricultural Science, Kobe University (1994). He was an assistant professor (1994-2002), an associated professor (2002-2009) and a professor (2009-present) at the Kobe University in Japan. His major fields of interest are animal breeding and genetics. One of his interests is to study the origin and biodiversity in cattle and goats. His major publications include: mtDNA biodiversity of Asian cattle: "Zebu cattle are an exclusive legacy of the South Asia Neolithic", *Molecular Biology and Evolution*, 27(1): 1-6. (2010); "17. Duality in *Bos indicus* mtDNA Diversity, Support for Geographical Complexity in Zebu Domestication", *The Evolution and History of Human Populations in South Asia -Inter-disciplinary Studies in Archaeology, Biological Anthropology, Linguistics and Genetics-*, Springer, pp.385-391, (2007); and "Independent Mitochondrial Origin and Historical Genetic Differentiation of North Eastern Asian Cattle", *Mol. Phylogenet. Evol.* 32:539-544. (2004)". mannen@kobe-u.ac.jp

Abstract

Cattle have had an important but incompletely understood association with early human civilization and expansion. The study of their origins and diversity may enlighten on hitherto unknown aspects of prehistory. All modern cattle have been considered to be domesticated from captured aurochs at the primary domestication centres of Anatolia and the Fertile Crescent, however, this is an opinion that may be an artifact of the history of archaeology. Recent molecular studies using mitochondrial DNA (mtDNA) reveal molecular evidence for a predomestic divergence between zebu, or humped cattle (*Bos indicus*), and taurine, or humpless cattle (*Bos taurus*). Subsequent mtDNA studies for the origin and genetic diversity of Asian *Bos taurus* cattle revealed five major types of mtDNA haplogroups, T (auroch type), T1 (African type), T2 (Middle East type), T3 (European type) and T4 (Asian type) in cattle. The *Bos taurus* mtDNA sequences fall into several geographically distributed haplogroups. Mongolian cattle showed higher genetic diversity due to genetic admixture through ancient trade. Detailed examination of *Bos indicus* mtDNA sequence diversity also reveals a separation of sequences into discrete haplogroups. The analysis clearly coalesces to two moderately divergent predominant haplogroups, termed I1 and I2. Higher nucleotide diversity in Indian than anywhere across Asia for both the two observed mitochondrial lineages (I1, I2), indicates India as the centre of origin for all *Bos indicus* cattle. In addition, the nucleotide diversity supports this region as the origin of I1, which this mitochondrial lineage is the main one observed across East and Southeast Asia. For I2, more complex pattern of diversity was detected. The result indicates difficulty for pinpointing of a single region for the origin of the I2 haplogroup.

Keywords: biodiversity; cattle; domestication; mitochondrial DNA; nucleotide sequence; origin

Diversity and Breeding of Flowering Cherry in Japan

NAKAMURA Ikuo¹, TAKAHASHI Hiroko¹ and SATO Yo-Ichiro²

1. Graduate School of Horticulture, Chiba University, Chiba, Japan.

2. Research Institute of Humanity and Nature, Kyoto, Japan

NAKAMURA Ikuo is an associate professor at the Graduate School of Horticulture, Chiba University. He received his Ph.D. in agriculture from Nagoya University (1985). He was a post-doctoral fellow at the Department of Biology, Washington University at St. Louis (1985-87), a researcher at Plantec Institute Co., Yokohama (1987-88), an assistant professor at the National Institute of Genetics, Mishima (1988-93), and a principle researcher at Iwate Biotechnology Research Center, Kitakami (1993-98). His major research interests are: molecular phylogenetic studies on the speciation; cultivation of crop and ornamental plants; and productions of stress tolerant crop and ornamental plants through the genetic engineering techniques. His major publications include: "Straight Walk: A modified method of ligation-mediated genome walking for plant species with large genomes", *Anal. Biochem.* 388 (co-written with T. Tsuchiya and N. Kameya) (2009); "Genome-type-specific variation of the 19th intron sequence within the RNA polymerase I largest subunit gene in the genus *Oryza*", *Plant Syst. Evol.* 282 (co-written with H. Takahashi, T. Sato and Y.-I. Sato) (2009); "*Aegilops* section *Sitopsis* species contains the introgressive *PolA1* gene with a closer relationship to that of *Hordeum* than *Triticum-Aegilops* species", *Breed. Sci.* 59 (co-written with B. Rai, H. Takahashi, K. Kato and Y.-I. Sato) (2009); and "Divergent evolution of wild and cultivated subspecies of *Triticum timopheevii* as revealed by the study of *PolA1* gene", *Genet. Res. Crop Evol.* 57 (co-written with H. Takahashi, B. Rai and K. Kato) (2010).
inakamur@faculty.chiba-u.jp

Abstract

In Japan, the flowering of the cherry tree (subgenus *Cerasus*) in early spring has been a principal signal for farmers to begin rice cultivation. People in Japan therefore have a particular interest in cherry blossoms, and the species have a long and intricate history here. Nine native species of flowering cherry are present in Japan; they can be classified into three groups, Yamazakura, Miyamazakura, and Edohigan. More than 250 cultivars of Japanese flowering cherry have been selected or bred from these wild species. Two species, Oshimazakura and Edohigan, have specially contributed to the breeding of flowering cherry. Although Edohigan is distributed in most area of Japan, Oshimazakura belonging to the Yamazakura group is an endemic species around the Izu Peninsula. The breeding of flowering cherry cultivars is classified into three stages. Before the Azuchi-Momoyama era (1573-1603), about 20 cultivars were selected mainly from Yamazakura. During the first half of the Edo era (1603 - 1715), as Shoguns of the Tokugawa government ordered Daimyos to donate fantastic ornamental flowers including flowering cherry, about 30 cultivars with mutant phenotypes, such as many petals, were brought to Edo (Tokyo). After the last half of the Edo era (1716 -), more than 200 cultivars have been bred through natural and artificial hybridizations.

Keywords: cherry blossom; breeding; cultivar; artificial hybridization; genetic diversity

Genetic Diversity of Rice in Japan: Social, Environmental and Historical Dimensions

SATo Yo-Ichiro

Research Institute for Humanity and Nature, Kyoto, Japan

SATO Yo-Ichiro is a Deputy Director-General and professor at the Research Institute for Humanity and Nature (RIHN), Japan. He received his PhD from the Department of Agronomy, Kyoto University (1986). He was an assistant at Kochi University (1981-), a research associate in the National Institute of Genetics (1983-), an associate professor at Shizuoka University (1994-), professor at the RIHN (2003-present) and the Deputy Director-General at the RIHN (2008-present). His major field of interests is plant genetics. One of his interests is studying the origin and biodiversity in rice. His major publications include origin of *japonica* and *indica* rice: “*Japonica* rice carried to, not from, Island Southeast Asia”, *Nature Genet*, 40 (11): 1264-1265. (2008). He is also interested in archeobotany in Afro-Eurasia. He edited with two editors for publication of journal, “The Archaeobotany of Asian Rice, *Archaeological and Anthropological Sciences*, 2 (2): 57-131”. sato@chikyu.ac.jp

Abstract

Genetic diversity, or within-species diversity is an aspect of biodiversity, and it has been playing important roles for agro-ecosystems to be sustainable. On the Japanese archipelago, rice plant at the present time is grown from 24°N to 42°N, over 2000 kilometers in distance. To adapt to such wide variations in environmental conditions, rice plant was diversified into many varieties with different genes and characters. Both tropical and temperate *japonicas* were grown until the end of the Edo era (1603 – 1868). During the Medieval Age, a series of *indica* varieties called “*champa rice*” were introduced from Vietnam. This temporarily brought about an increment of a high level of genetic diversity among Japanese rice. Differential cooking ways and cultural requirements helped maintain various types of rice varieties, such as glutinous rice (mochi), red rice, and aromatic rice. By the beginning of the Modern Age, more than 4000 varieties were recognized and were actually grown for commercial use, but the number is now reduced to 88 varieties. Of these, only four varieties dominate approximately 65 percent of the total production, which are Koshihikari and its descendents. Before the 20th century, morphological inconsistencies as well as DNA polymorphisms existed even within a variety, suggesting that the society at that time was accepting *diversity*. Active selections by producers in their breeding program that required short stature, and more recently, a high level of cooking quality requested by consumers and the market resulted in the loss of genetic diversity in rice today. Recovering genetic diversity in commercial rice varieties is required to avoid a risk of epidemics. A couple of attempts for recovering a high level of genetic diversity will be introduced.

Keywords: rice; genetic diversity; cultural requirements; breeding, local variety

Is There Satoyama in Europe?

RACKHAM, Oliver

Corpus Christi College, UK

RACKHAM, Oliver is an honorary professor of historical ecology in Corpus Christi College. He is a botanist and an ecologist. His major fields of interests are history of vegetation and landscape in Britain, Ireland, the Mediterranean and the United States. In 1998 he was awarded the OBE for "services to Nature Conservation". In 2006 he was appointed as an honorary professor of historical ecology in the Department of Plant Sciences, University of Cambridge. He received his master's degree from Corpus Christi College, Cambridge (2007-2008). His major publication include: "The History of the Countryside" (1986) Phoenix, New Ed edition; "The Illustrated History Of The Countryside" (2003) UK: Weidenfeld & Nicolson; and "Woodlands" (2006) London: Collins. or10001@cam.ac.uk

Abstract

In most European countries long-standing relationships have developed between human activities and the natural world. Some of these are small in scale, as with archaeological sites; others cover tens of hectares, as with English woodland and Swedish wooded meadows; others cover entire landscapes, as with the networks of hedges that surround fields in England and the many types of savanna-like landscape in which trees (especially ancient trees) are scattered in grassland. All these places have been maintained, if not created, by various forms of land management, often extending over hundreds of years. Sites and features that are valued for one reason tend to be significant for an apparently unrelated reason: thus English churchyards have a spiritual function but are also very significant for plant and animal life and especially for lichens. Ancient trees are not only historically significant (as in Japan) but are the homes of specific animals and plants for which young and middle-aged trees are not a substitute. These satoyama-like places are threatened as much by the decline of historic management as by direct destruction. The people responsible for them need to be aware of the many layers of significance that such places carry.

Keywords: ancient trees; grassland; historic management; refugia; satoyama; wood pasture

The History of Semi-natural Grasslands in the Japanese Archipelago: Changes of Human Activities and Persistence of Grassland Habitats

SUKA Takeshi

Nagano Environmental Conservation Research Institute, Nagano, Japan

SUKA Takeshi is a researcher at the Nagano Environmental Conservation Research Institute (NECRI), Nagano Prefecture. He received his Ph.D. in entomology from Kyoto University (1998). His major field of interests is conservation biology. His major publications include : “Historical Changes of Semi-Natural Grasslands in the Central Mountainous Area of Japan and their Implications for Conservation of Grassland Species”, in Bull. NECRI 4 (2008); and “Semi-Natural Grasslands of Nagano Prefecture: History and Distribution”, Japanese Society of Grassland Science ed., Ecology and Conservation of Grassland (2010). suka-takeshi@pref.nagano.lg.jp

Abstract

Ecological succession under the absence of human disturbances brings most vegetation into forest in warm and humid climate of the Japanese Archipelago. This circumstance seems to have been ordinary throughout the Holocene. However, grassland species of plants and insects since the glacial period have survived till today in semi-natural grasslands within the Satoyama landscapes. In order to clarify what kinds of human activities have maintained habitats of these plants and insects, I reviewed the history of vegetation, archaeology and Japanese history, and investigated the relationship between the human activities and distribution of the grassland species. In cool and dry climate of the last glacial period, human subsistence was dependent on hunting. After that, forests had expanded in warm and humid climate of the Jomon period (ca. 12,000-2400 year BP), and it caused a shift of human subsistence to plant resources use in forests. On the other hand, semi-natural grasslands have sustained until now for over 10,000 years on outer rim of the Aso volcanic crater in Kyushu as well as other parts of Japan. Analyses of the microscopic charcoal in black soils suggested that frequent wild fires have caused the persistence of the semi-natural grasslands. Human activities are suspected to be the sources of these fires. People used these grasslands as pasture fields for horses since the Kodai (ancient) period. Intensified usage of grasses from meadows expanded after the early modern period. The black soils are often distributed where grasslands had been maintained for long times by fire. The distribution records of endangered grassland species of butterflies and bumblebees statistically well coincide with the distribution of the black soils in the central highland of Japan. This coincidence implies that historical usage of semi-grasslands, regardless of human subsistence changes, have provided continual habitats for the grassland species since the glacial period.

Keywords: black soil; fire; grassland species; microscopic charcoal; semi-natural grassland

Exploitation and Conservation of Forest Resources in a Mountain of Early Modern Japan

SHIROUZU Satoshi

Chuo Gakuin University, Chiba, Japan

SHIROUZU Satoshi is an associate professor at Chuo Gakuin University. He studies Japanese history, especially on the structures of the governance system and the subsistence in the mountainous and seaside communities of medieval and early modern Japan. His main study fields were coastal area and mountainous area in Fukui prefecture, and mountainous area in Yamanashi prefecture and Nagano prefecture. He is also positively related to the arrangement and the preservation of regional historical materials. He was a JSPS fellow at the Institute for the Study of Japanese Folk Culture, Kanagawa University (1992-1994). His major publications include : “Shirarezaru Nihon: Sanson no Kataru Rekishisekai [Unrevealed Japan: Historic World in the Mountainous Community]” (2005) (Nihon Housou Shuppan Kyokai [Japan Broadcast Publishing, Co.,ltd.]); “Chusei no gyogyo to gyogyo-ken: Kinsei eno tenbou wo fukumete [Fishery and fishing rights in the medieval ages: Including the view to the early modern ages]” In: “Okunoto to Tokikuni-ke, kenkyu-hen 2 [Okunoto area and Tokikuni family: Chapters of research 2]” (2001) (Heibonsha Limited, Publishers); and “Kinsei sankan chiiki ni okeru kankyo-riyuu to sonraku: Shinano-Koku Akiyama no seikatsu-sekai kara [Utility of the environment and the village in the mountainous area of early modern ages: From a view point of the everyday life in the Akiyama, Shinano-no-kuni province]” (2005) (Kokuritsu Rekishi Minzoku Hakubutsukan Kenkyu Houkoku [Bulletin of the National Museum of Japanese History]). ven05021@nifty.com

Abstract

Over-harvesting of natural resources frequently occurred with growing population and industrial development in early modern Japan. The forest environment around mountainous villages was often drastically changed by over-logging. In the Akiyama region, trans-boundary area between Shinano province (present Nagano Prefecture) and Echigo province (present Niigata Prefecture), the forest faced a serious crisis in the 18th century when the forest was almost clear-cut by people living in and around the village.

At that crisis, people living in the Akiyama region tried to create new subsistence by using various and congesting forest resources. They started to use hardwoods for wood crafts that they had not been used. In addition, they reduced logging pressure of external people by various methods; such as taking advantage of the *sutakayama* custom—breeding hawk chicks in a protected forest as a gift for the Tokugawa *shogun*—and taking legal action against them.

While external people, who logged all trees, regarded the nature as logging resources for their consumption, while people living in the village treated major forest changes as a serious issue, since they intended to use forest not only as a logging resource but also for hunting, as a gathering place and as a source of various forest ecosystem services. They intended to eliminate external pressure on the forests by using feudal-lord authority and thus succeed to sustain fundamental nature environment. I conclude that nature conservation activities ultimately depend on goodwill of the native people.

Keywords: mountainous village; Early-Modern; forest resources; Sutakayama (hawk breeding forest); congesting resources

Sustainability, Collapse and the Role of Management Appeared in the Satoyama's History of Natural Resource use

OSUMI Katsuhiko

Kansai Research Center, Forestry and Forest Products Research Institute, Kyoto, Japan

OSUMI Katsuhiko is a senior researcher at Kansai Research Center, Forestry and Forest Products Research Institute. He received his Dr. of agriculture from Kyoto University (2001). He was a technical official at the Forestry Agency (1979-1984), a researcher at Tohoku Research Center, Forestry and Forest Products Research Institute (1984-1991), a senior researcher at Japan International Research Center for Agricultural Sciences (1991-1993), a team leader at Tohoku Research Center, Forestry and Forest Products Research Institute (1993-1997), a team leader and a research coordinator at Kansai Research Center (1998-2008). His major field of interests is silviculture and ecology of broadleaf trees. His major publications include: "Vegetation patterns and their dependency to site conditions in the pre-industrial landscape of north-eastern Japan" (*Ecological Research* 18)(2003); "Reciprocal distribution of two congeneric trees, *Betula platyphylla* var. *japonica* and *Betula maximowicziana*, in a landscape dominated by anthropogenic disturbances in northeastern Japan (*Journal of Biogeography* 32) (2005), *Silvics of Japan* (Co-edited, Japan Forestry Investigation Committee) (2009). osumi@ffpri.affrc.go.jp

Abstract

How did nature resource use sustained or collapsed in the history? Did the knowledge and technology of land managers play a good role? I reviewed researches about sustainability on the resource uses in the history in the Satoyama landscapes of Kansai area—middle of Japan. We found that sustained resource uses were involved some kind of managements and/or regulation in the most cases. In addition, we suggested that the secondary vegetation, in which natural resources were produced, were possibly not merely degraded ones but a kind of modified ones for obtaining the sustainable provisioning service in these sustainable cases. This habituation must be required some knowledge and technology. Here we introduce typical examples of Satoyama woodland.

Keywords: knowledge; technology; traditional; Satoyama; agrarian landscape; Japan; meta analysis