

Satoyama, Traditional Farming Landscape in Japan, Compared to Scandinavia

Björn E. BERGLUND

GeoBiosphere Science Centre, Quaternary Geology, Lund University, Lund, Sweden

Traditional agricultural landscapes have developed through prehistoric and historic time independently in Japan and Northwestern Europe. However, land-use shows many similarities reflected in the landscape. Farming has been dependent on resources from marginal areas surrounding farm village areas, which are named Satoyama woodlands in Japan and outlands in Scandinavia. The major resources have been timber, wood and charcoal fuel, litter for fertilizing, and food products such as nuts, berries, plant shoots, and mushrooms. Long-term land exploitation—sometimes over-exploitation—caused deforestation and the development of open landscapes. More efficient land-concentrated agriculture has caused overgrowing, while forest regulations have led to afforestation in recent centuries. The major difference between the two regions is that European agriculture involved grazing by cattle and sheep, and this resulted in fences being erected between pastures and villages. In Japan the staple diet has been based on seafood and rice and therefore there has been no need for pastures; as a consequence no fences occur in the landscape. Modern societies in both regions have appreciated the recreation value of traditionally managed cultural landscapes, and there have been private and communal initiatives to restore some such landscapes that are adjacent to cities.

Keywords: FOREST HISTORY, CULTURAL LANDSCAPE HISTORY, AGRARIAN LAND-USE, COPPING, GRAZING, SATOYAMA, INFIELD/OUTLAND, NATURE RESTORATION, JAPAN, SWEDEN

Introduction

Traditional farming economy has created landscapes specific to each area in the world, given the natural resources and the ethnographical traditions of each region. Farming landscapes that existed before industrialization are documented in archives, old maps, photos, and drawings, and they can also be traced back to prehistoric time thanks to palaeoecological and archaeological research based on source material in lake sediments, peat bogs, culture layers

etc. We can also find “relict” farming landscapes and peoples still practicing ancient land-use in so-called marginal areas in uplands or mountains of Japan as well as in northern Europe. In fertile areas, such as many coastal regions, modern agriculture and expanding cities have exploited and deforested such landscapes. This is the situation in central Europe as well as the mainland of East Asia. In densely inhabited Japan, large forest areas are still preserved in uplands from the coast to the alpine mountains, and environmental historians have sometimes called Japan the Green Archipelago (Totman 1989).

During my stay at the International Research Center for Japanese Studies, Kyoto, in the spring of 2005, I was offered the opportunity to visit several upland sites in Honshu and Kyushu with traditional farms, making it possible to understand these landscapes and their land-use history. The study areas during my excursions were the Kuraoka uplands 倉岡丘陵 of central Kyushu; the Ayabe valley 綾部溪谷 in the northwestern part of Kyoto prefecture, central Honshu; the Rakusai 洛西 area and the hill known as Katsurazaka 桂坂 in the western part of the city of Kyoto, central Honshu; the mountain areas around Shiramine 白峰, north-central Honshu; Tama 多摩 and Sayama Hills 狭山丘陵 on the urban fringe of Tokyo; and Mt. Zao 蔵王山 and the Akiu river valley 秋保溪谷 west of the city of Sendai, northeastern Honshu. There are similarities as well as differences when comparisons are made to landscapes in Scandinavia. These will be discussed in this paper.

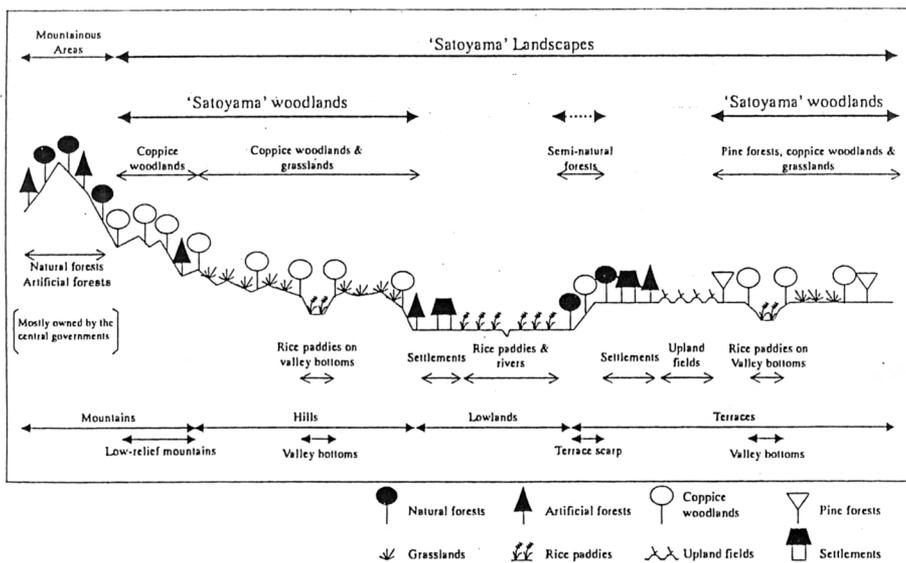


Fig. 1. Transect from mountains/uplands to a river valley with various landscape elements and definitions of Satoyama woodlands and Satoyama landscape (after Yamamoto 2001, from Takeuchi 2003).

Definition of Satoyama Woodlands and Satoyama Landscapes in Japan

A monographic presentation of Satoyama 里山¹ has recently been compiled (Takeuchi et al. 2003) and I will frequently refer to papers in this book. The term Satoyama was originally used to denote forests surrounding farm villages and managed by farmers for different

needs—timber for buildings, wood for fuel and charcoal production, leaf litter and twigs used as fertilizer for crops, particularly in the rice paddy fields situated in the lowlands. Sometimes silk production occurred in the mountain forests. Different food products were also collected, such as bamboo shoots, nuts of chestnut (*Castanea crenata*) and horse chestnut (*Aesculus turbinata*), mushrooms, and young shoots of ferns and herbs (Kobori and Primach 2003, Takeuchi 2003, Tsunekawa 2003, Iguchi 2002). These areas might be called Satoyama woodlands, as they comprise uplands surrounding cultivated valleys dominated by rice paddy fields (Figs. 1–2). Farms with their economic buildings are most often situated in the border zone

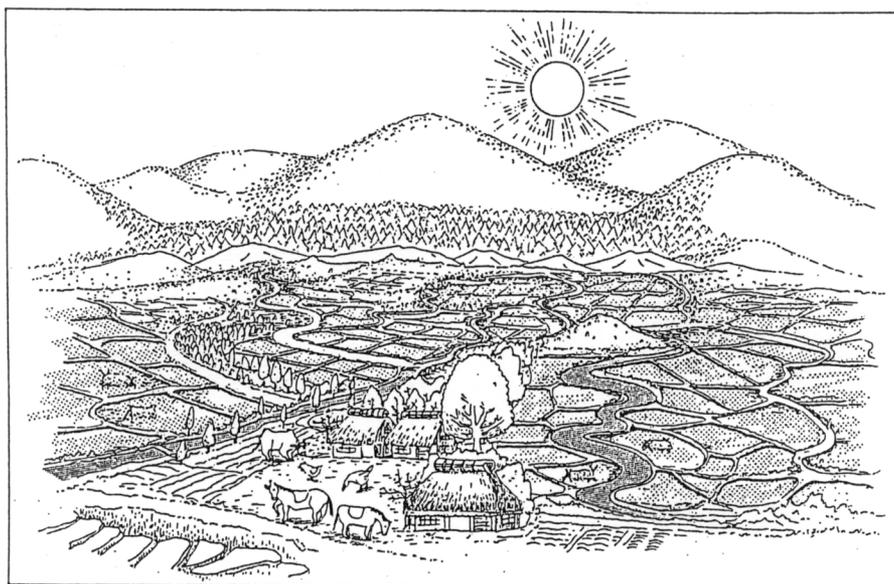


Fig. 2. Sketch of a Satoyama landscape with wooded uplands in the background. It represents a landscape from the Edo period until ca. 1955 (from Tsunekawa 2003).

between wooded uplands and open farmland in the valleys (Fig. 3(a)). The term Satoyama has been taken to refer to such areas for hundreds of years, at least from as far back as 1759, according to a written source mentioned by Tokoro (1980). In higher mountain areas, coal production has been based on available trees occurred as well as primitive swidden (slash-and-burn) agriculture. These areas were named *Okuyama* 奥山 (Yasuda verbal communication). During the twentieth century the phrase “Satoyama landscape” has sometimes been used to refer, more broadly, to the entire landscape used for agriculture. This term is understood to mean that in addition to Satoyama woodlands, valley areas and plains with farmlands, farm settlements, water reservoirs, and the like are all considered to be elements in the agrarian land-use system (Yamamoto 2001, Takeuchi 2003). In the following, the most important use of the Satoyama—the woodlands—will be described.

To maintain agrarian production before commercial fertilizers became available in the twentieth century, the gathering of forest litter for fertilizing the fields was extremely important. It has been calculated that 1 ha of rice paddy needed several ha of forests to sustain it (Kobori and Primach 2003). A village with 50 ha of paddy fields needed 500–600 ha of



Fig. 3. (a) Top: Satoyama landscape with paddy fields in a valley close to farm houses, surrounded by forested uplands. Ayabe 綾部, Central Honshu. (b) Lower left: Coppiced beech wood in a Satoyama woodland slope. Akiu 秋保, west of Sendai, northern Honshu. (c) Lower right: Slash-and-burn field in Satoyama woodlands, *Seichi no yama* 聖地の山, Shiramine, north-central Honshu. Photos Björn E. Berglund, 2005.

Satoyama woodlands for litter gathering (Mizumoto 2003). Trees were coppiced in order to increase the production of tree trunks for timber, fuel, and particularly charcoal production; this means that trees were cut at the stem base, with a rotation of about ten years. Even today, coppiced woodlands characterize ancient Satoyama woodlands, although often the trees in such areas today are overgrown because the coppicing was done several decades ago. Coppicing for coal production was practiced even in mountainous areas far from farm villages (Okuyama), as can be observed in one of my study areas, central Kyushu (Fig. 3(b)). In such areas small-scale farming used the swidden (so-called slash-and-burn) technique (Fig. 3(c)).

Animal husbandry has never been important in Japan. By tradition the Japanese diet is based on rice and seafood. Only during the period 300 BCE to CE 700 were cows kept for

milk and meat production (Yasuda verbal communication). Neither sheep nor goats were kept in Japan. Therefore, Satoyama woodlands have only exceptionally been used as pastures, possibly at a few places where horses were kept for military needs. When cattle have been kept, they have not been allowed to graze outdoors, mainly because of the risk of pollution. In a landscape without grazing animals, there is no need for fences, and this explains why countryside Japan is lacking fences such as we find in Scandinavia or hedgerows such as in, for example, England. Exceptions can be found today in northern Honshu and Hokkaido, where there are ranches limited by fences, but those are modern establishments.

Land-use History of Satoyama Woodlands

Traditional farming in a Satoyama landscape has a long tradition, according to written sources. The extensive use of woodlands similar to the historical Satoyama woodlands can possibly be traced back to the Jōmon period, the Japanese Stone Age. The forests had resources necessary for buildings, fuel, and food. Gathering of nuts from chestnut and horse chestnut trees in northeast Japan has been demonstrated by Kitagawa and Yasuda (2004), and dated to the Middle Jōmon period, 5500–4500 years before present. Such gathering is still practiced in the mountains around Shiramine, north-central Honshu, another of my study areas (Kitagawa et al. 2004). Rice cultivation started around 3000 years ago. The rice paddy fields needed fertilizing and litter has, therefore, been gathered in the upland Satoyama areas since this time.

Forest exploitation was first documented in CE 600, and three periods of predation, or severe deforestation, can be distinguished: ancient (CE 600–850), early modern (CE 1570–1670), and modern (CE 1900–1959) (Totman 1989). The main causes are to be found in coal production (for metallurgy, house-warming etc.) and cutting of firewood and timber for house building, not least for monumental constructions. The negative environmental effects, e.g., erosion and flooding, were recognized fairly early in history, and already in the seventh century CE, authorities and landowners emphasized the importance of restricting general access to forests (Totman 1989, pp. 26–27). A document from CE 821 states “The fundamental principle for securing water is found in the combination of rivers and trees” (Totman 1989, p. 29): this indicates early awareness of how forests serve to protect running water. By the ninth century, this awareness led to the promotion of tree-planting. The problem of predation reoccurred some centuries later because of expanding population and increased demand for agricultural areas. The rulers of the Edo/Tokugawa period therefore initiated “regenerative forestry” in early modern Japan, around CE 1600 (Totman 1989, p. 80 ff.). Forest exhaustion approached an ecological catastrophe, but this was avoided thanks to strict regulations and large-scale afforestation projects that were implemented all over the country (Totman 1980, 1989, McMullen 1999, Diamond 2005). However, the expanding modern society around 1900 pushed Japan into a new phase of overcutting the mountain forests. A forest law from 1907 altered forest policy from regulation to utilization (Iwamoto 2002) because of increased timber production. Around 1950–1960 the situation changed again, thanks in part to new efforts of forest plantation, but also because at the same time the use of coal as an energy resource diminished and the use of plant remains as fertilizers of the paddy fields came to an end. The traditional use of Satoyama woodland ceased definitely and uplands became avail-

able for modern forestry (Iwamoto 2002) or urbanization (Ichikawa et al. 2006). The present forest landscape in Japan is the result of the political change in forest management in the mid-twentieth century.

Traditional Agrarian Landscapes in Scandinavia

Farming in Scandinavia since prehistoric time has been based on a combination of animal husbandry—with cattle, sheep, and goats—and cereal production. This had a major impact on the landscape and the structure of farm villages for at least 3000 years. Single farms as well as farm villages with their crop fields and hay meadows, defined as *infields*, were fenced off from surrounding *outlands* (sometimes named outfield, Swedish *utmark*; see Figs. 4–5). In uplands or mountain areas of Norway and northern Sweden, marginal summer farms, which sometimes developed into permanent farms, have been frequent since the Middle Ages (CE 1000–1500, Andersson et al. 1998, Emanuelsson et al. 2003), and in western Norway possibly since 1000 BCE (Kvamme 1988). Summer farms were mainly used for summer pasture, a form of transhumance, which can still be found in some mountain areas. In general, outlands were forest areas on poor ground, sometimes rocky or boulder-rich, in uplands. Cattle, sheep, goats, and horses grazed in these areas. In coastal areas with a mild climate, such as southwest-

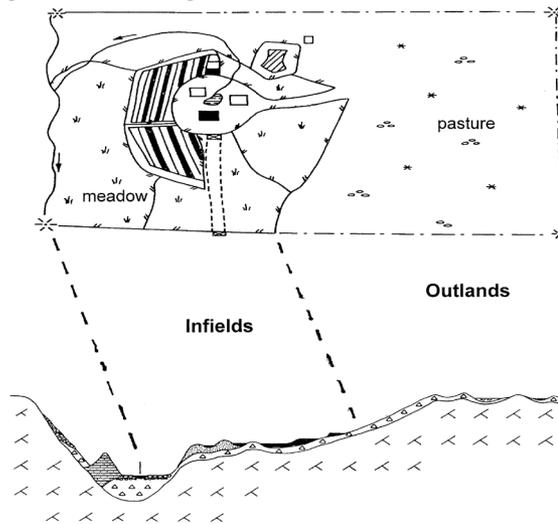


Fig. 4. Sketch of an infield/outland landscape in southern Sweden, map and transect through a river valley. Note thick soil deposits in the valley, shallow deposits in the wooded uplands. Stone fence erected along the soil boundary between infields and outlands. Revised from Sporrang 1970 and Hebrand and Jonsson 1976.

ern Scandinavia, the grazing animals were kept outdoors all year around. The outlands were common land for a village or group of villages until enclosure regulations in the nineteenth century led to land division between individual farms. This structure is still often visible in the present-day landscape, particularly in uplands and coastal areas, thanks to preserved fences (made of wood or in southern Sweden stone walls) around infields and between owner strips (Fig. 6). Stone walls surrounding infields may sometimes be very old; it is reasonable to assume that they were laid out when the village was established, often during the Iron Age more than one thousand years ago. Such fences were placed along the border between good soils for farming and

the bad soils more suitable for grazing and forestry. The outlands correspond to the Japanese Satoyama woodlands. From the beginning they were forested, but centuries or even millennia of grazing brought about deforestation because of reduced tree growth. Half-open woodlands (Fig. 8) or even quite open heath areas (along coasts in southwestern Scandinavia) or barren steppe-like areas (on the limestone islands of Öland and Gotland in the Baltic Sea; Fig. 6) were formed. The outlands also provided timber, wood for various tools, fuel, charcoal, game,

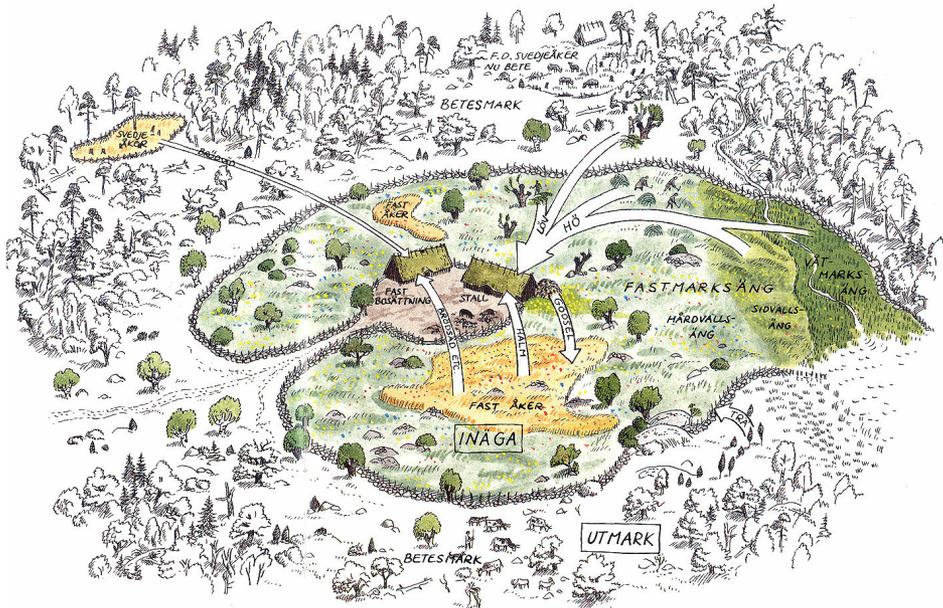


Fig. 5. Schematic drawing of an infield/outland landscape in southern Sweden. Arrows indicate transport of hay (Swedish: hö), leaf fodder (löv) and straw (halm) to the barn (stall), manure (gödsel) from the barn to the field (åker), cereals (brödsäd) to the farmstead. Infield (inäga) with meadows (äng) and fields are surrounded by a main fence. Outland is a half-open wood pasture (betesmark) with a single swidden field (svedjeåker). Farm buildings of Iron Age type. Drawing by Nils Forshed. From Ekstrand et al. 1988.



Fig. 6. Grazed outland on a rocky limestone plateau. Note the stone walls between village and pasture as well as between land belonging to different land-owners. Photo Björn E. Berglund, 2006.

berries, and in ancient times herbs for food (for ethnobiological references, see Hoeg 1974, Pettersson et al. 2001). Coppicing was also common, particularly in southern Sweden and Denmark (Bergendorff and Emanuelsson 1996). The multiple use of outlands resembles the situation in Japan. Traditional use of woodlands by pasturing, coppicing, and other practices is also known in uplands in Central Europe (Pott 1989, 1993).

These areas were also available for colonization of new farms, e.g., during the eleventh and twelfth centuries CE as well as in the twentieth century when the farming population ex-



Fig. 7. Infield area with pollarded trees growing in a meadow with a small hay field. Farmstead in the background. Photo Björn E. Berglund, 1968.

panded (Lagerås 2007). From as long ago as the late Bronze Age (around 1000 BCE), they were used for primitive farming—small fields were created after clearing and burning. Rounded stone mounds are the still-visible remnants of such activities (Lagerås 2007).

The infields included meadows, often sparsely wooded (Fig. 7). These areas were used for winter fodder needed for cattle, sheep, and other livestock. The herb-rich meadows were mowed in order to obtain hay, and the deciduous trees were pollarded (twigs were gathered) to obtain leaf fodder. Such meadows were characteristic of European farm villages based on traditional agriculture including animal husbandry (Rackham 1976, Pott 1993, Haeggström 1998).

The traditional farming landscape with infields and outland woods or heaths is well documented in historical village maps, in many cases in map sequences that cover the last 300 years (Helmfrid 1994). Such source material has been used in several historical landscape projects (e.g., Berglund 1991). Today the traditional structure has been destroyed by expansive modern agriculture in fertile areas of coastal plains and river valleys, or by urban expansion.

Fig. 8. Wood pasture with birch trees in outland wood pasture. Photo Björn E. Berglund, 1979.



Some outlands have been transformed by modern forestry into monotonous woodlands with coniferous plantations; others have been transformed by spontaneous forest regrowth when grazing has ceased. However, relict areas are still to be found in uplands, in mountains and in some coastal regions (Sporrong et al. 1995, Ekstam and Forshed 2000, Haeggström 1998).

Environmental Values and Conservation Approaches Today

Satoyama woodlands in Japan and outland woodlands in Scandinavia are mosaic landscapes that contain a variety of ecosystems, from forests to open vegetation, sometimes inclusive of arable fields. Therefore, they have high biodiversity, as is well documented in both Japan (Fukamachi et al. 2001, Kobori and Primach 2003, Kuramoto and Sonoda 2003, Washitani 2003) and Sweden (Ekstam et al. 1988, Lindbladh 1999, Nilsson 1997, Cousin and Eriksson 2002). Because the survival of these landscapes is threatened, there is growing interest in preserving and managing them as nature reserves or recreational areas. In Japan this is also supported by local government entities in places where Satoyama woodlands are being rediscovered as attractive leisure areas. Some localities have established environmental units and citizens have organized new associations to take initiatives in this activity. People are invited to take part in restoration work over weekends, and in some cases they are welcomed to cultivate small “garden lots” with rice or vegetable paddy fields in Satoyama village landscapes. This nature management movement is now well established in many cities. It is sometimes named after a mascot named Totoro トトロ, a character in a well-known animated children’s film in which it is depicted as living in a Satoyama forest. Such enticements have brought many families and school groups to visit nature areas (Tabata 2001, Iguchi 2002, Nakagawa 2003, Kuramoto 2003). For a great many Japanese, Satoyama woodlands are easily accessible areas where everybody can enjoy nature as a contrast to the stressful daily life in crowded cities. In Scandinavia, wild or managed nature areas are very often found short distances away from villages and cities. There, also, nature organizations promote recreation in areas that were previously part of the traditional agrarian landscape. To guarantee this, many nature reserves have been delimited. There are examples of infield/outland landscapes with so-called Nature schools where school children—together with their teachers—are taught old farming and forestry techniques and are offered the possibility to practice these in the field.

Although managed Satoyama woodlands and related grazed outland landscapes have decreased enormously in Japan and Scandinavia, there is a desire and hope that some areas will be preserved thanks to national nature conservation interests. Nature conservation is also sponsored by the European Union. Most important are the efforts of local farmers and individual nature enthusiasts. In Japan there is now a national movement for integrating rural areas with cities named *Mura-Okoshi* 村起し, Village Revival (Iguchi 2002). Medical experts have also realized that active recreation in attractive and easy accessible nature areas is an investment in good health (Grahm 1994); in Japan this has been called “forest therapy” (*shinrin-yoku chiryō* 森林浴治療; Takeuchi et al 2003). Preserving and managing Satoyama and related nature areas near cities should be in focus for nature conservation all over the world, in my view, and Japan has given us an example to follow!

Conclusions: A Comparison between Japan and Scandinavia

The Satoyama landscape in Japan and the infield/outland landscape in Scandinavia are both the result of traditional farming and land-use. They represent self-sufficient farming economy based on local production from arable land with fertile soils and wooded land with less fertile, often hilly and stony soils. The contrasting landscape, with rich and poor soils, is characteristic of many agricultural regions. This has influenced land-use patterns all over the world. In the cases of Japan and Scandinavia, these cultural landscapes have their roots in prehistory, at least 3000 years ago. The main differences between Japan and Scandinavia can be traced in the different agrarian economies and diets, rice-fish-seafood and wheat-meat-milk culture (Yasuda 2002, Myrdal 2006, map p. 124). Also, the Japanese society has a long tradition of protecting forest and water resources (Totman 1989, Yasuda 2001, Diamond 2005). In Sweden forest regulations can be traced back to the fourteenth century, but they did not become important until the seventeenth century (Eliasson 2002). Similarities and differences of these traditional farming landscapes, as they were managed before 1950, are shown in Table 1, below.

Table 1

JAPAN

Rice-fish-seafood culture

Pasturing of minor importance

Forest products: fuel, timber, charcoal, litter manure, mushrooms and other vegetables, game

No fences

Terracing and irrigation of arable fields

No drainage of woodlands

Fertilizing: litter and livestock manure, human waste

Agrarian expansion into uplands restricted

Forest protection/regulation from the seventh century

Strong ruler impact (shogun, daimyo)

SCANDINAVIA

Wheat-meat-milk culture

Pastures important for cattle, sheep, goats

Forest products: fuel, timber, charcoal, berries, mushrooms and other vegetables, game

Fences important

Irrigation rare

Drainage frequent since 1900

Fertilizing: livestock manure, human waste

Expansion possible in marginal areas

Forest protection/regulation from the fourteenth and seventeenth century

Weak ruler impact (state/church, nobles)

Growing populations, expanding cities, and efficient/industrialized agriculture have changed these landscapes. Both Satoyama woodlands and Scandinavian outlands are now sometimes set aside for modern forestry, and cultivated fields have been transformed into large-scale fields for monocultures, particularly in Scandinavia. Growing interest among citizens for nature recreation, however, along with some small-scale crop production, have changed the situation in some areas. Some Satoyama landscapes and farm villages have been restored and are being managed in the traditional way. This, I believe, is the path of the future for maintaining the cultural landscape heritage and providing a healthy environment that can be visited by people living in crowded cities.

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NOTE

1 The word Satoyama is capitalized and not italicized in this essay, following the example of Takeuchi et al. 2003.

要旨

里山、日本における伝統的な農村風景
—スカンディナビアと比較して—

ビョーン・ベルグルンド

伝統的な農村風景は、歴史以前・以後を通して日本においても北歐においてもそれぞれ独自の発展をみてきた。しかしながら、その土地利用は多くの共通項を景観に反映させている。農業は、集落を囲む周辺の土地からの収穫物に依ってきた。日本においては、里山と呼ばれる森林地帯であり、スカンディナビアにおいてはアウトランドと呼ばれる僻地である。主な収穫物は、樹木、木材、木炭、土地を肥沃にする腐葉土、そして木の実や木イチゴ、草木の芽、きのこなどがある。長期にわたる土

地開発は一ときに開発過多に陥るが—森林破壊や開けた景観を生んできた。効率的な集約農業は雑草を蔓延らせ、一方で、ここ数世紀における森林統制は造林を促した。両国の主要な違いは、ヨーロッパの農業は牛や羊を放牧し、結果として牧草地と農村との境に垣根を巡らしたことである。日本においては、常食が魚介類や米であったことから牧畜の必要性が低く、結果としてその景観に垣根というものが現れなかった。現代社会においては、両国とも伝統的に営まれてきた文化に基づいた景観の余暇価値に注目し、私的にも地方自治体としても、そのような近郊の景観の保護に積極的である。