Satoyama
The Ideal *and the* Real

You can see them in just about any Japanese department store: mass-produced scroll paintings depicting a thatched cottage with a water wheel, set among mountains draped in mists. It is a genre-type image, but like all clichés it has an enduring appeal because behind it lies the substance of truth. Many Japanese will wax nostalgic about an idyllic rural way of life. And although the reality was often far from easy or comfortable, that way of life had a compelling beauty and also has great relevance for our own time.

BY BRIAN WILLIAMS

Above: Family crests with motifs from nature; Opposite: Satoyama landscapes from across Japan, photographs by Kit Takenaga

In Japanese, the ideal implied in those sentimental scrolls is often summed up in one word: *satoyama*. Literally hamlet-mountain, satoyama has become something of a buzzword, and features extensively in Japanese government literature for the October 2010 COP10 conference on biodiversity in Nagoya. Like all buzzwords, satoyama is often used with less than complete comprehension of what the concept really entails. This is problematic, especially given the commendable calls already being made for a "global satoyama." A more comprehensive understanding of both the ideal of satoyama and the contemporary reality are clearly needed to guide efforts towards a more sustainable society. This satoyama section of KJ 75 aims to contribute to such a clearer understanding.

MOST MARKEDLY antithetical to the American Midwest's vast agro-industrial grid of croplands, satoyama is a curvilinear mosaic of mixed forests, grasslands, rice paddies and other fields, with streams, ponds and reservoirs, most of this centered along the base of a mountain or hill. The satoyama ideal, born out of an intimate and even reverential connection with nature, entails living with the land and on it, without arrogating it exclusively to human use — living in a sustained way over many generations.

Sufficient productivity and biodiversity can coexist over the long term, as they have all over the world in the past. Precisely by allowing and even fostering other life, we enable human life as well to be sustained over time. This is, in essence, what a global satoyama should mean. Japan's satoyama is but one example of traditional cultures thriving without depleting biodiversity. The island of Bali, for instance, has supported a dense population with a vibrant culture, while conserving much of its rich biodiversity. Until as recently as the 1940s even an apex predator like the tiger survived on the island.

Above: village, fields and sea; Bottom: spider lilies (*higanbana*) bloom along the edges of rice paddies in September, Fukuoka prefecture, photographs by Kit Takenaga

Middle: Man as part of nature — traditional satoyama landscape depicted by famous Japanese painter Hayami Gyoshu, 1910

Thus, protecting biodiversity involves "not only preserving pristine environments, such as wilderness, but also conserving human-influenced natural environments, such as farmlands and secondary forest, that people have developed and maintained sustainably over a long time. These traditional production landscapes — and the sustainable practices and knowledge they represent — are increasingly threatened in many parts of the world, due for example, to urbanization, industrialization, and rural population increase and decrease." These are the words of Japan's Ministry of the Environment, in explaining its global 'Satoyama Initiative.'* An even greater threat, conveniently ignored, is the widespread adoption of ruthlessly efficient modern agro-industrial practices — which are fossil-fuel and agro-chemical intensive, and destructive to both biodiversity and soil quality.

Perhaps the crucial characteristic of a satoyama landscape is that human dominion is not complete. There are gaps which other life forms exploit, to be in turn exploited. Crucian carp spawn in paddies. Soon their fingerlings are preyed upon by herons and egrets, who hunt those paddies for tadpoles and aquatic insects as well. Trees of no value to people are allowed to subsist in these satoyama forests, and as a result so does any life that depends on those trees for sustenance. There one can find delicious mushrooms and delicate fruit hanging from vines. Birds and insects are abundant. Flying squirrels glide from giant cypresses spared in the sacred forests of the Shinto shrines. The rivers run pure, and their fish never give out. Snakes and wild boar, weasels and dragonflies — the list goes on and on. And so does all of that life, together with that of the humans provided for by this landscape.

IMPORTANTLY, many of the habitats for this bustling life would not have existed were it not for traditional human land usage. The satoyama world both fosters and harbors a range of ecosystems found neither in wholly wild regions nor in more modern agro-industrial and urban zones. True, paddies replaced some marshy areas, but they also created wetlands where none had existed, to the benefit of salamanders and egrets. Satoyama woodlands are normally sunnier and airier than natural forests, and support a different undergrowth. Grassland domains such as those around Mt. Aso in Kyushu would soon revert to woodland without the time-honored seasonal burning that has kept the trees back. Bamboo groves traditionally planted on river levies for reinforcement grow into yet another type of habitat. Satoyama-type land use engenders bountiful and varied plant and animal life, and such ecosystems are more resistant to infestations, less prone to radical population fluctuations, and also more resilient to disasters and changing climate.

Interconnectedness and continuity are two essential properties of the satoyama forests, fields and streams, ensuring the survival of species that use more than a single niche. Foxes spend their days in the woods but in the evening hunt the grasslands and paddy borders. Swans from Siberia roost in marshy areas and ponds, but forage in the winter stubble fields. Herons feed in the paddies, but nest in the trees. In the waters of a flowing stream, firefly larvae subsist on small freshwater snails. Then on wet nights in March they surface to climb the earthen banks, burrow in and pupate, emerging in June for their dance of light. They will mate on bushes and tree branches overhanging the water, and their eggs will drop back into the stream that was their cradle. Carp fingerlings who survived their vulnerable youth in flooded paddies swim down the irrigation canals to the rivers and ponds, and fish as varied as eels, salmon, and *ayu* sweetfish swim up those same rivers to spawn. Each species finds its nooks and havens.

THOUGH SHIRETOKO PENINSULA at the northeastern tip of Hokkaido supports the densest population of brown bears in the world, and while the Shirakami Sanchi in northern Honshu may well be Earth's largest remaining tract of virgin beech forest, as a whole Japan is *not* distinguished by vast areas of untouched wilderness. What Japan does have to offer, historically speaking, is one of the premier examples of an environment inhabited and managed by people to the benefit of both human and non-human life, a montage of stable ecosystems. Despite occasional famine or denuded hillsides, Tokugawa Japan (1603-1868) was a society that produced virtually no waste, and it thrived for centuries in a land of rich and abundant biodiversity. Tokyo Bay, now a polluted water wasteland, was a treasure chest of seafood and home to countless waterfowl, even though one of the world's largest cities at the time crowded its shores.

It is precisely this coexistence with wild plants and animals that offers valuable lessons for our era of degraded farm-

* For more on the Japanese government's Satoyama Initiative, see Catherine Knight's article online: kyotojournal.org/biodiversity/model.htm

Cultivated Systems: Areas in which at least 30% of the land is cultivated. Source: Millennium Ecosystem Assessment

"What we now understand from remote sensing data is that agriculture is such a dominant part of land use worldwide that if we're talking about where is the habitat, where is the biodiversity going to come from, a very substantial part of the habitat is in or around agricultural areas. Yet we have not been managing our agricultural areas as habitat. We don't even think of them as habitat. I think it's a revolutionary thing to be thinking about how we can do agriculture in a way that does that."

— Sara Sherr, Founder of Ecoagriculture Partners

Satoyama landscapes in Bali (photograph by Stewart Wachs) and in Nepal (photography by Sajal Sthapit) contrast with single crop grid in Kansas

FLOODED RICE TERRACES IN NIIGATA PREFECTURE, PHOTOGRAPH BY KIT TAKENAGA

SMOTHERING STREAMS & HABITATS

BY BRIAN WILLIAMS

PLEASE DON'T MISREAD THIS, but Japan is the most dammed country in the world. The lengthy archipelago has virtually no free-flowing streams left, with more than 210,000 dams in all. Of these, over 2,500 are so-called 'large dams' taller than 15 meters, but likely the most ubiquitous are the check dams, big and small. In Toyama prefecture, formerly Japan's most spectacular mountain valley with its highest waterfalls, these check dams reach their most colossal absurdity — there is even a museum devoted to them!

Check dams are built to counter erosion and control flood damage. And while they *can* serve some function in these regards (although perhaps only until they become choked with sediment) generally the erosion and mountain slope destruction associated with the dams' *construction* outweigh any such positive benefits. As well, their impact on biodiversity and water quality is also an unmitigated disaster, cumulatively far larger than any mega-project. Check dams create an insurmountable obstacle to fish migrating either up or downstream, and block free passage of other animals in the current, such as giant salamanders. They markedly distort the composition of sediment flows away from gravel and sands and towards very fine silt, which has clearly adverse effects on river, pond, lake and seashore habitats. Where check dams also impound water, the ensuing stagnation and trapped organic matter inevitably impair water quality. Finally, they are singularly unlovely. If you'd like to see for yourself what a Japanese check dam is like, and along the way inspect concrete embankments and step-blocked river beds seriously clogged with cement, just head to the nearest hills and follow any stream. As surely as water will wet you, you'll find what you're looking for.

Given the ubiquity of check dams in Japan, in years to come when innovative, more natural ways of dealing with erosion and flooding are developed, the removal of check dams and resuscitation of Japan's smothered streams will likely become a growth industry. May that era dawn soon..

lands, monoculture forests and rivers polluted by agricultural and urban runoff. Efforts to conserve biological diversity still largely focus on preserving wild habitats such as coral reefs and rainforests. One strategy considered crucial to that goal is an outgrowth of the 'green revolution' which, through the use of improved crop strains, agrochemicals, machinery and GMOs, maximizes efficiency on present agricultural lands, and thus hopes to curtail their further expansion. But from the standpoint of biodiversity, it is precisely the cultivated lands that we ignore at our peril. They make up approximately one quarter of Earth's land surface (the prime productive portion of it) and they are being damaged and expanded at the very same time. The satoyama alternative shows that a rich variety of species can coexist and even prosper with judicious human use of the land. It is time to realize that agricultural areas can and indeed must also function as habitat, and readjust our modern practice accordingly.

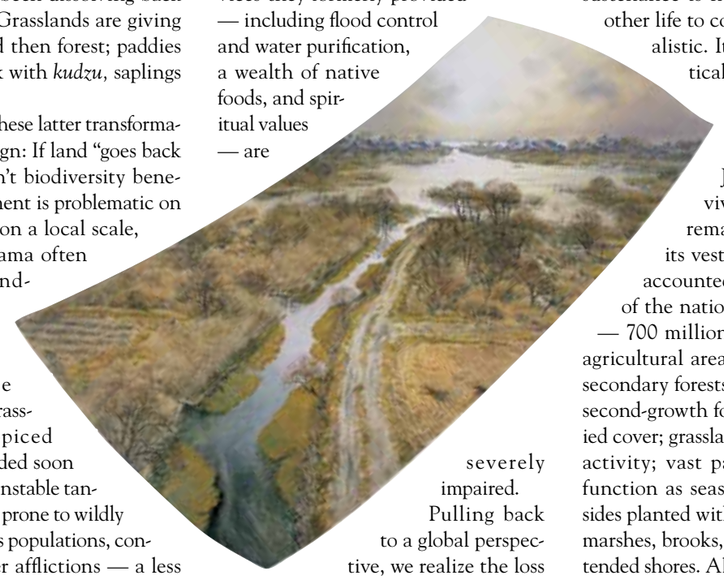
To the degree possible, urban areas also need to incorporate these principles. Humanity passed a fateful milestone several years back, when more than half the population of the planet became urban dwellers. This figure could rise to 80 percent by 2030. Without major changes, life in these dystopian cities will be desperate, brutish and short. Some starts are being made, such as rooftop and wall gardens small and large. Even the Sears Tower in Chicago, once the world's tallest building, is spending several hundred million dollars to green its roof areas, with an eye to reducing cooling expenses and enhancing appeal. Greening the roofs of a city will negate its heat island phenomenon. And it is a short step from decorative plantings to food production and habitat creation. Urban rivers are also badly in need of redemption. Who wouldn't prefer a stream with fish, turtles and waterbirds over an open sewer? Instead of fleeing to the countryside, we need to bring it into our cities. Other life will make our urban areas more sustainable and more livable for us.

BEYOND SATOYAMA IS THE BACK COUNTRY OR OKUYAMA. "SHADOW PLAY" (MT. TANIGAWADAKE, GUMMA PREF.); BELOW: PARABOLIC PAINTING OF A SATOUMI LANDSCAPE OF LAKE BIWA, BOTH WORKS BY BRIAN WILLIAMS

THESE, THEN, ARE THE LESSONS of satoyama. Over the past century, however, and particularly the past fifty years, Japan has to a large degree lost both its traditional rural ways of life and its satoyama ecosystems. As people migrated from countryside to city, from agriculture to blue and white collar jobs, farmland increasingly gave way to suburban sprawl and industrial development. And in more remote areas formerly cultivated land has been dissolving back into wilderness. Grasslands are giving way to brush and then forest; paddies are growing thick with *kudzu*, saplings and bamboo.

At first glance these latter transformations appear benign: If land "goes back to nature," doesn't biodiversity benefit? But the argument is problematic on two levels. Even on a local scale, the loss of satoyama often means the landscape becomes less diverse. In Japan's hot, humid climate open patches of grasslands and coppiced woods left untended soon become choked, unstable tangles of vegetation, prone to wildly fluctuating species populations, contagions and other afflictions — a less stable and less diverse community of plants and animals.

And worse is the way satoyama is too often "tended" in the modern era: mixed forests converted to uniform tree plantations; rivers lined with concrete; rice paddies straightened out and enlarged, with the ditches and streams that supply their water also straightened, stepped and paved, destroying the habitats they formerly provided. Add to this a barrage of chemical fertilizer, insecticide and herbicide. Japan produces perhaps two percent of the world's food, but consumes about ten percent of the globe's agrochemicals to do so. The ponds, marshes, lakes, estuaries and tidal flats collectively designated *satoumi* have suffered a similar fate, and are now either filled in or polluted, eutrophic and hemmed with concrete. In short, the formerly picturesque and richly biodiverse satoyama and the eco-services they formerly provided — including flood control and water purification, a wealth of native foods, and spiritual values — are severely impaired.



Pulling back to a global perspective, we realize the loss is even more serious. Where once we harvested food from nearby forest, paddy, and garden, we now extract it from corporate megafarms in China or California. Where nearby coppiced woods once provided firewood along with habitat for wildlife, we now pump our fuel from miles beneath the Gulf of Mexico. It can be argued that these changes have brought gains in efficiency and material wealth that offset the loss in biodiversity they also inevitably entail. As we weigh these trade-offs, however, what is critical is that we keep our perspective as broad as possible. We trade satoyama not only for convenience and short-term productivity, but also for degraded pseudo-wilderness, denatured farmland, an ever-growing waste stream, and greater dependence on fossil fuels.

As we belatedly reassess that tradeoff, we must relearn the lesson of genuine satoyama: Exploiting nature for human sustenance is not wrong if it allows other life to coexist. This is not idealistic. It is far-sightedly practical. True satoyama-style land use achieves this: Half the endangered species on Japan's Red List survive in the sanctuary of remaining satoyama and its vestiges, which originally accounted for fully 40 percent of the national territory of Japan — 700 million hectares of assorted agricultural areas plus 800 million of secondary forests. These areas include second-growth forests with highly varied cover; grasslands created by human activity; vast paddy areas that also function as seasonal wetlands; riversides planted with bamboo groves; and marshes, brooks, lakes and ponds with tended shores. All of these created, and to a limited degree still provide, a range of habitats different from the original face of the land, but arguably as diverse — and far more so than the industrial scale monocultures so common today. In this section, we strive to illuminate these interconnecting habitats of the endangered satoyama world.