SATOYAMA AND THE HIRONO GROUNDS
Agroecological Restoration in Japan

by Judith Lyn Arney
University of Victoria, BC, Canada
2007

A sunny afternoon in June. The bamboo forest rattled subtly, only barely perceptible in the brief spaces between splashing and voices in the foreground. I was on the Hirono Grounds, just outside of Kobe, one of three cities that make up the second largest city-state in Japan. I was there by invitation from Professor Fumiaki Taniguchi of the Environmental Philosophy and Education Department at Konan University. Shin-deep in paddy muck with about thirty Japanese university students and fellow Canadians Sarah, Damon, Shea and Kate Turner, I was trying (often in vain) to place tiny rice seedlings into the dank mud beneath me, which teemed with insects, frogs and other creatures I hopefully only imagined. We were all participating in a seminar activity designed to bring the traditional rice field back into the lives of Japanese people. From an aerial view, however, this rice paddy was just one piece of the patchwork in the bigger picture of agroecological restoration in Japan. Its exact nature can be elusive; Professor Taniguchi says, “Satoyama cannot be only seen. It has to be felt”. So, we were out there at the Hirono Grounds that afternoon, feeling the rice in our hands and a beckoning to the larger landscape of traditional agriculture in Japan.

Satoyama

The written character for *sato,* 里、means village, while *yama,* 山、means mountain. Satoyama is not officially the traditional agricultural system of either of the two distinct indigenous groups of Japan, the Ainu in Hokkaido or the Ryukyu in Okinawa. Satoyama is, however, a very old and remarkable integrated ecosystem template in which forested areas, rice paddies, vegetable plots and fish bearing streams operate interdependently, providing sustenance for centuries of rural communities. The culture’s philosophical roots in the animist tradition of Shinto

infused the nature of satoyama with both spirits and shrines. Red *torii* gates pepper the fields of the countryside still.

Unfortunately, Japan's recent industrial economy has radically transformed the natural environment once so revered by its people. Since 1945, a massive (and failed) reforestation program wiped out over half of all the native oak, pine and laurel forests of Japan for plantations of European cedar, or *sugi*. By 1993, 55% of Japan's coastline was lined with cement slabs or tetrapods. By 2001, the River Bureau had dammed or diverted all but three of Japan's 113 major rivers (Kerr 2001). Local agriculture collapsed as the youth moved to the burgeoning cities and today many farmers are simultaneously employed in *doboku*, construction, a fervent national industry which ceaselessly paves rivers, builds dead end roads into mountains and carves unnecessary highways into the countryside. Japan, the nation whose economy rose and fell so drastically in the past four decides, the nation so renown for its cultural worship of nature, has been subject to industrialization forces even North Americans would find stultifying, and for which no practical end is in sight.

It is in this context that Professor Taniguchi and his office members are working to re-connect Japanese citizens and youth to agricultural production and establish networks across Asia to address issues of environmental degradation, restoration and climate change. In satoyama, we find the principles important to projects around the world dedicated to the restoration of agro-ecosystems: reduced mechanization, integration of ecosystem types and the reassertion of local control over local food supply.

Human participation at a human scale

In Japan, the rice paddy has undergone a considerable transition from no-till hand labour to mechanized operations. The result is the loss of the biodiversity and an increase of soil erosion in the flooded fields. The repeated application of pesticides and weed suppressants has a detrimental effect on life in the rice paddy. In traditional rice paddy cultivation, the rice paddy is submerged over winter, playing host to many creatures but reducing the incidence of weeds. Mechanization of rice production has

also had a deleterious effect on the integrity of rice in Japan. In the rice nursery, seedlings are produced in small cells at 32 degrees Celsius, promoting the growth of germs. The tractors transport the seedlings into rice field and plunk them down in perfect rows across vast expanses of the industrial rice paddy, an organism much greater in surface area than its country cousin in the old system of satoyama. Unfortunately, this superiority is only surficial. In traditional no-till rice agriculture, the root stalks of the previous season are left behind, strengthening the soil, reducing erosion and recycling the organic waste of each season into the integrity of the next season (Amano 2007).

Brian DeVore has proposed that the operation of heavy machinery separates farmers from the ecology of their land (2007). He describes a birding movement underway in North Dakota, USA, which familiarizes farmers with the bird populations of their region and how to best act as stewards for these populations. One farmer noted that using a quad to lead the cattle in and out of their pen significantly reduced his ability to monitor the birds on his farm, and he began leading the cattle in on foot instead. Another farmer began leaving his pastures unclipped and found that the number of birds on his property increased drastically. Once these farmers were connected to the life requirements for these bird species, they chose to reduce the scale of their operations from a machine to a human level. The conception of farmland as habitat for more than profitable species promoted responsibility to the landscape. It also gave these farmers the chance to observe the subtle ecological processes on their land, leading to conclusions often contradictory to management techniques prescribed by national agricultural associations. Many bird species act as beneficials in an agroecosystem, preying on pest insects; they are also a good monitoring tool, “the “canary in a coal mine” so to speak. Their presence or absence demonstrates the level of toxicity to which we are exposed (Carson 1962, DeVore 2002). “Precision agriculture” is now being discussed by the agriculture industry in the US, a process that involves GPS-operated combines plowing the soil - a completely farmer-less operation. In the end, of course, less work for the farmer means exactly that, and rural communities may become extinct altogether under such a mechanized system, while the production of our food takes place under remote video surveillance from offices in cities.

Wendell Berry suggests that the modern distaste for physical labour has altered the lifestyle pattern of our society at a reckless cost (1970). The labour of agriculture has meaning in its very purpose, the production of sustenance for a community. Conversely, indoor jobs rarely embody a sense of equivalent holistic accomplishment. He argues that meaningless work produces meaningless labour; leisure assumes the same frantic character as work within our current economy. In our efforts to mechanize labour to avoid drudgery, we further ourselves from the raw materials out of which our necessities are built, as in the case of the farmers stepping down from their tractors, surprised to find a community of birds doing the work of countless pesticides right beneath their feet. Berry states that labour is a "happy function of human life" (1970). Joel Salatin complains that "intellectuals" flee the countryside for high paying jobs elsewhere, resulting in a brain drain from the agricultural community. This in turn renders agricultural operations much more vulnerable to the profit seeking, input-toting influence of the commercial agricultural industry (Pollan 2006).

Certainly, this epidemic exists in Japan. Villages are becoming depopulated and agriculture intensifying in mechanization (Kerr 2001). Satoyama represents a demechanized progress towards the conservation of food resources, biodiversity and cultural cohesion. The key to the biodiversity of satoyama lies in its human scale and integrated landscape.

The field and the forest

On November 21, 2007, the Saanich News ran an article entitled, "Keeping Farmers Honest" (Cardone). It went on to describe the actions of the local assessment authority in reviewing 204 properties in Saanich that claimed farm status. Twenty-two of these were subsequently stripped of their farm status and denied the associated tax break. The removal of farm status can mean an increase of thousands of dollars in property taxes. During these reviews, Saanich assesses the amount of productive land on a farm and develops a split classification if a significant portion of the property is wooded, as "nothing sellable is being produced there" (Cardone 2007). Under threat of a potentially ruinous tax increase, Saanich farmers have plowed over woodlots and

forested areas on their properties at the cost of something much greater. The forest contributes in countless invisible ways to agricultural operations, safeguarding hydrological processes, sequestering carbon, blocking winds that can both erode the soil and waste a significant amount of a crop plant's energy in an effort to simply stand up straight (Pollan 2006). The mistake is a narrow scope, an eye only to species of obvious profit.

An agricultural ecosystem operates like any other ecosystem, in a web of biological interactions that must be complemented, not destroyed, by its managers. The ecological edge plays host to both weeds and their predators. Small enclaves of wooded areas provide habitat for beneficial species, like birds, which will prey on the pests of the field (DeVore 2002). However, since most birds don't venture more than a few hundred meters from the safety of cover, the forest must be integrated into the agricultural ecosystem for the mutual benefits to take place.

There is a kickback from the "domesticated" side of the fence in return; DeVore depicts a farmer who had by happenstance not enough money to complete a fence, recommended by the agricultural association, barring his cattle form a small creek which ran through his property. Years later, this farmer found that the casual passing of cows had in fact retarded the succession of the unguarded riparian zone, leaving an open creek bed and unrestricted flow of water, whereas the fenced area had become overgrown to the point that root masses had upset the creek bed and obfuscated its meander. The farmer took note and revised his barriers (DeVore 2002). Pollan also describes the role of pigs in the forest on Polyface Farm in Virginia, where Salatin fences off a quarter acre section and allows his pigs in to disrupt the soil, which facilitates the desirable grass seeds to germinate amongst the mature trees. Instantly a savannah is born, good for pigs prone to sunburn, good for birds to nest in and, especially after a layer of fertilization from the pigs is laid down, good for the forest (2006).

It is in the pursuit of a sustainable complement between the "wild" forest and the "domesticated" field that traditional ecological knowledge is so applicable. Principle 22 of the Rio Declaration on Environment and Development states that indigenous people and local communities have roles in environmental management

because of their traditional knowledge. In Japan, traditional ecological knowledge is linked to the practice of satoyama. Within this system, the oak and pine forests (now overtaken by an even canopy of European cedar) were prevented from growing dense by regular harvest for wood products, ensuring habitat for a diverse range of wildlife species (Tabata). The river systems of satoyama, while vital for irrigation in the paddies, provided residence for dragonflies and fireflies, important pest predator species. Leaves from the satoyama woodlands were collected as compost for the rice paddies. The integrated ecosystems of satoyama also allowed for wildlife migration through its varied terrain. In his essay, *The Future Role of Satoyama woodlands in Japanese Society*, Hideo Tabata lists a plethora of plant and animal species that thrive in the satoyama agroecosystem. He writes:

> A good example of the ecological interconnection in the biological community is provided by *Sophora flavescens*, which grew abundantly in grasslands and was used for thatching and pasture for domestic animals and *Shijimiaeoides divinus* which only feeds on *Sophora*. As grasslands decreased in area and number, the population of *Sophora* decreased and this butterfly has now become an endangered species. It is perhaps ironic that both these species now survive on the practice fields of the Japanese Self-Defense Forces (Ishii, 1997).

Tabata claims that since the satoyama woodlands have lost value in the wage economy, the biodiversity of Japan has concurrently suffered significant loss.

The cultural importance of both field and forest in a satoyama landscape was demonstrated on the Hirono Grounds that June. Our group took a walk through the forests adjacent to the rice fields, went hunting for *takenoko*, bamboo shoots, and Professor Taniguchi pointed out *sanshou*, a peppery herbaceous plant, and *hebiichigo*, "snake strawberry", the wild strawberry of the area. These plants are little known by urban Japanese and, as is occurring here in BC, with less use comes a decrease in both the integrity and occurrence of traditional plants (Turner 2000, Beckwith 2004). In its ecosystem diversity, satoyama reflects the possibilities of combining nature conservation with food production.

Food sovereignty

I believe agroecological restoration should respond to the problems that currently exist and are predicted to increase concerning food sovereignty (La Via Campesina 2007). Food production can no longer expand onto new territories but must be recovered from past and exiting croplands (Edwards et al 1990, “Food Security” 1999). While oil is the only commodity more frequently exchanged in the international marketplace than agricultural products, international trade is a business that is not required to address hunger (“Food Security” 1999). The challenges regarding acquisition of food has more to do with access than availability, as resource management objectives are always tied to the food and material culture in which the economy is embedded (Anderson 2005, "Food Security" 1999). Food sovereignty is about more than having access to sufficient food resources; food sovereignty involves the establishment of local control over the methods of local food production and supply (La Via Campesina 2007).

F.H. King, in his 1911 book. *Farmers of 40 centuries*, documents the agricultural systems of China, Korea and Japan, states that “[the USA] must square its practices with a conservation of resources which can make endurance possible”. King praises traditional eastern Asian rice agriculture for its sustainability, its recycling of wastes and its ability to conserve soil and water resources. As in North America upon European arrival, the landscapes King saw in early twentieth century eastern Asia were not self-sustaining but reliant upon traditional management practices to maintain biodiversity and conservation of species (Anderson 2005, King 1911).

Use so often risks overuse (Anderson 2005). In this sense, agricultural operations should be guided by principles of ecological restoration, sustainability and food sovereignty. However, Dennis Martinez claims that there is not enough TEK in restoration dialogue (IPRN 2007). The application of TEK is deeply connected to food sovereignty, particularly because the use of TEK without regard for the contributory culture is in itself a “hollow effort” (Anderson 2005).

In Japan, food sovereignty is complicated by the nation's geographical size relative to its population. Currently, Japan relies on agricultural imports for roughly 60% of its food supply (Amano 2007). However, there is a protection policy for rice production; rice is, of course, Japan's chief staple and an integral part of both Japanese cuisine and culture. Satoyama produces rice within a sustainable framework, whereas current use of agrichemicals and mechanization is overshadowing the rice fields of Japan and threatening soil fertility. Japan is over 43% forested, mostly due to mountainous terrain (Kerr 2001); soil erosion and infertility on the flatlands represents a considerable threat to rice production.

* * *

An advisor for a national government at the turn of the twentieth century, when consulted on the beginnings of commercial industrial infrastructure in his country, recorded a resounding disagreement to this policy, stating that "agriculture is the lynchpin of the national wealth" (Berry 1970). In Japan as in many other parts of the world, commercial industry and international market forces have displaced traditional agriculture. Agroecological restoration is connected in principle to sustainable agriculture and food sovereignty. It is dependent on a fundamental basis in knowledge indigenous to place. The challenges that face the restoration of traditional agriculture in Japan involve the entire national economic framework and industrialization mentality. Yet, as John Zarb claims in his article, "Small Holding Up", sustainable farming is not designed to support the current socio-economic infrastructure; it is designed to replace it (2001). As the work begun in the Hirono Grounds of Kobe spirals outward, Japan has the benefit of an enduring agricultural heritage to which it may return in the landscapes of satoyama.

Remember that rice plants never grow from rice plants, and rice seeds never produce rice seeds. First the seeds must grow into the plants and then the plants produce the seeds. From the beginning of creation there has always been this endless process of transformation and transmigration. It is interdependence.
-Ninomiya Sontoku

References

Anderson, Kat M. 2005. *Tending the Wild: Native American Knowledge and the Management of California's Natural Resources.*

Amano, Masao. 2007. *A Study of Environmental Education Program through No-Tillage Rice Farming.* Unpublished lecture notes: Konan University, Kobe, Japan.

Beckwith, Brenda. 2004. The "Queen Root of This Clime": Ethnoecological Investigations of Blue Camas (*Camassia leichtlinii* (Baker), Wats., *C. quamash* (Pursh) Green, Liliaceae) and its Landscapes on Southern Vancouver Island, British Columbia. PhD Dissertation, University of Victoria, British Columbia.

Berry, Wendell. 1970. *A Continuous Harmony: Essays Cultural and Agricultural*. Harcourt Brace Jovanovich Publishers: New York, USA.

Cardone, Erin. "Keeping Farmers Honest". 2007, November 21. Saanich News, pp A1, A2.

Carson, Rachel. 1962. *Silent Spring.* Houghton Mifflin Company: USA.

DeVore, Brian. 2002. "When Farmers Shut Off the Machinery". In: Dana Jackson and Laura Jackson (Eds), *The Farm as Natural Habitat: Reconnecting Food Systems with Ecosystems* (pp 83-95). Island Press: Washington, DC.

Edwards, Clive A., Rattan Lal, Patrick Madden, Robert H. Miller and Gar House (Eds). 1990. *Sustainable Agricultural Systems*. Soil and Water Conservation Society: USA.

"Food Security in a Changing World". September 1999. *Aviso: An Information Bulletin on Global Environmental Change and Human Security (*Issue No. 4).

IPRN (Indigenous People's Restoration Network). http://www.ser.org/iprn/westernscience.asp. Accessed Nov-Dec. 2007.

Kerr, Alex. 2001. *Dogs and Demons: The Fall of Modern Japan.* The Penguin Press: USA.

King, F.H. 1911. *Farmers of 40 Centuries: Permanent Agriculture in China, Korea and Japan.* http://www.earthlypursuits.com/FarmFC/FFC/F_%20H_%20King%20Farmers%20of%20Forty%20Centuries.htm.

La Via Campesina. http://viacampesina.org/main_en/index.php. Accessed Dec. 2007.

Pollan, Michael. 2006. *The Omnivore's Dilemma: A Natural History of Four Meals.* The Penguin Press: USA.

Rio Declaration on Environment and Development. 1992. http://www.unep.org/Documents.Multilingual/Default.asp?DocumentID=78&ArticleID=1163.

Tabata, Hideo. *The Future Role of Satoyama Woodlands in Japanese Society.* http://homepage.mac.com/hitou/satoyama/docs/future.html.

Turner, N.J. et al. 2000. Traditional ecological knowledge and wisdom of aboriginal peoples in British Columbia.

Zarb, John. 2001. "Small Holding Up". In *The Ecologist, Vol 30 (No. 9),* pp 40-44.