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IN THE FIELD

Japan's green resources: Forest conservation and social values[1]

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Abstract. Modern and historical Japanese societies are and were quite comfortable with a nature defined, designed, and dominated by humans. While contemporary Japanese are concerned about the environment, especially about non-timber ("green") forest resources, conservation organizations are generally small and locally focused. Public forests, accounting for 40 percent of all Japan's forests, are intensively managed. At the national level, the timber program is operating below cost and there is increasing emphasis on non-timber management and rural economic development. A professional elite largely determines forest management goals and cultural barriers minimize broad public participation. Increasingly aware of the environmental impacts of their industrial society at home and abroad, the Japanese are becoming more environmentally concerned. Government agencies are especially proactive in enhancing environmental understanding among Japanese citizens and in sharing their resource management expertise with other Pacific Rim nations.

Key words: Japan, Forest management, Forest policy, Nontimber resources, Values

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Introduction

Among industrial nations, Japan boasts the highest percentage of land devoted to forest. While that fact may conflict with the common vision of Japan as a ferro-concrete megalopolis, it is true. The 125 million people that live in the "green archipelago," as named by Japan scholar Conrad Totman (1989), are concentrated in the eastern coastal plains of Japan's main island, Honshu. The steep and unstable mountainous terrain forced development of cities and agriculture into the flatlands.

The forests found refuge in the mountains. Culturally, mountains and forests often function as a single concept. Many English words that we associate with forests use the word "mountain" (*yama*) in Japanese. For example, a forest fire is *yamakaji* (mountain fire), and communally owned village forests are either *iriaiyama* or *satoyama*.

In this paper I explore three major themes in terms of institutions, managerial economics, and social-cultural context:

1. A Green Perspective, offering an interpretation of Japan's environmental viewpoint, especially as it relates to its forests,
2. Managing the Green Forest, with a focus on non-timber goods and services (green resources),
3. How Green Will Japan's 21st Century Be? An exercise in subjective forecasting.

Totman (1983, 1985, and 1989) traced the historical exploitation of Japan's forest and the emergence of forestry in pre-modern Japan. Tanaka et al. (1998) links early forestry practice with temple maintenance and agricultural needs. The cultural context within which environmental values are shaped (and forestry is practiced) is influenced partly by religious beliefs. Bernard (forthcoming) suggests that Shinto plays a key role in forming Japanese environmental values.

Today, there is on-going dialogue between Japanese and US forestry professionals on how to meet the changing social demands for forest resources. I hope to link history and culture to the emergence of green resources management in Japan and to provide

insight into Japanese efforts relative to US approaches to similar issues.

The "green perspective" that I have developed from my own studies as well as from other researchers provides a basis for understanding the contemporary institutional response for the provision of green resources. While changes come slowly, the adaptations in forest management and shifts in social values suggest a greener future.

A green perspective

In the 1960s and 1970s, the environmental movement adopted green as its rallying color. Green ecology flags became fashionable decorations on our gas-guzzling cars and Green parties emerged on the European political scene. In popular culture, being green became synonymous with caring for the environment.

During that period in Japan, the Minamata Bay mercury poisonings and other horrors of industrial pollution fueled a growing public awareness that the rapid industrialization following the war was exacting a toll on the island's environment and limited natural resources. Ordinary citizens and all levels of government began to appreciate that the post-war recovery and subsequent economic booms had large environmental costs.

Americans and Japanese feel that pollution control and environmental protection are important aspects of social well being. But, I think the Japanese ideal involves a much more pronounced participation in nature by humans. In critiques of Western civilization, Descartes's dualism is often blamed for Western estrangement from nature. Westerners sometimes look longingly at Eastern philosophies and religions that regard humans and nature as a unified whole.

Following the traditions of their indigenous religion, Shinto, the Japanese feel a strong connections among themselves, nature, and the deities or *kami* (Jinja-Honcho, 1996). This attitude was strengthened by the imported philosophies of Taoism, Confucianism, and Buddhism, especially Zen Buddhism (Kornhauser, 1989). Reischauer (1981) notes that the Japanese find "personal fulfillment through identification with the beauties and processes of nature" (p. 148). While some may think of Japanese people as being close to nature, due to influences of nature-based Shintoism and the harmonizing ideas of Buddhism, the reality is that the Japanese are quite comfortable with a nature defined and designed on human terms. Bernard (forthcoming) suggests that nature is not valued as "wild nature" but that it does have value as "humanized nature." Traphagan's (1998) account of his landlady's insistence on pulling up wildflowers from the backyard and creating an orderly flower and vegetable garden exemplifies Japanese affinity for nature on human terms.

Human-dominated environments are to be expected in this nature-loving society because Japan is a small and crowded place. And it has been a crowded place for a long time, with a civilization dating from about AD 600. People's survival required manipulating nature to create rice fields for food, communal forests for fuelwood and green manure, and institutional forests for the production of timbers for castles, temples, and other structures. There are no vast wilderness areas in the Japan through which post-industrial humans have only recently passed. The land has been exploited for a broad range of goods and services for centuries.

The "oft-heard cliché about their oneness with nature" (McQueen, 1989: 22) and the "myth (of) ...a people in intimate communion with nature" (Woronoff, 1980: 269) suggest that Westerners assume an affinity for nature by the Japanese, both historically and contemporarily. Given the relatively high population levels and the demands for resources for infrastructure, the pre-modern Japanese despoiled forest and field on a grand scale. Living in harmony with nature meant periodic regional famines and the practice of *ubasute*, in which elderly people were abandoned in the mountains to die. While the reasons for *ubasute* were complex, the practice reflected the harsh calculus of resource economics. The marginal cost of keeping the elderly as part of community and family had exceeded the marginal benefit.

Long periods of peace in the Tokugawa era brought expanding populations, a shift toward urban living, and the creation, on a grand scale, of temples, shrines, and castles (Totman, 1983). Timber was in high demand. Because the expanding cities and towns were made of wood, they burned frequently and required reconstruction. The monumental works of the religious and ruling elite consumed huge quantities of the best timber. Enormous volumes of wood planks were used to set the edges of rice terraces.

Early on, Japan's rulers and villagers recognized the pressures being exerted on the forest. As fertile flatlands were stripped of trees to support a growing population, the increasing demands for timber, fuelwood, and green manure were shifted to the forested mountains. Denuded slopes failed frequently, destroying villages and farms. By the mid-17th century, cultivation of tree plantations had begun, initially as land protection measures and then expanded to deal with timber scarcity (Japan FAO Association, 1994). Totman (1983) suggests that, by the early 19th century, most old growth forests were gone and that Japan was "well into an era of plantation

forestry" (p. 276), pre-dating similar North American efforts by more than 150 years.

By tracking the treatment of nature in the classical literature dating from AD 700 and newspapers dating from 1880, Inoue and Ishibashi (1994) suggest that Japanese society passes through cycles in terms of relative emphasis in forest use. Depending on the socio-economic and political circumstances, forest production might dominate before giving way to spatial or spiritual domination. Spatial use in this context refers to use of the forest in place, typically as soil and water conservation forest. Spiritual use refers to aesthetics, outdoor recreation, and religious use. If spiritual and spatial uses are translated to their modern equivalents, then green resources have as much historical precedent as fiber exploitation.

In terms of spatial use, Japan shares a tradition similar to New England's tradition of open access to the forest. As with New Englanders, Japanese have long enjoyed the right to enter forestland, even if privately owned. New England heritage limits use to hunting and to access to public bodies of water. In Japan, people have rights to use the forest for recreation and gathering nontimber crops such as wild vegetables. These ancient rights have survived in various forms despite the powers of feudal landlords, Tokugawa *shogans*, and Meiji revolutionaries (National Land Afforestation Promotion Organization, 1991).

Even in the context of religious traditions that are nature-connected, today's average Japanese, like average North Americans, are quite disconnected from the roles of resource management in their daily life. For the typical Osakan, paper, milk, and fish come from the store, not from the forest, farm, or sea. Visitors to the national parks admire a few panoramas, take a lot of pictures, and buy over-priced souvenirs. They differ from North American tourists only in that they arrive by guided-tour bus rather than in the family car.

Reischauer (1981) finds it ironic that "for all their love of nature, (the Japanese) have done as much as any people to defile it" (p. 10). Bernard (forthcoming) observes that the high levels of environmental degradation in Japan are unexpected given the fluid boundaries between culture and nature. For those *gaijin* who still maintain idealistic views of the Japanese and their relationship with nature, one shocking discovery made upon visiting the island nation is that its citizens have elevated littering to an art form. "No Littering" signs are ubiquitous, but they are widely ignored. Ichiro Ozawa, a former secretary-general of the Liberal Democratic Party and co-founder of the Japan Renewal Party in 1993, noted the littering epidemic in his *Blueprint for a New Japan* (1994), a book on political economy, not on environmental issues!

Nearly every scenic turnout along most mountain roads has trash of all kinds scattered down the slope. Newspaper, garbage, motorcycle frames, old tires, and other household wastes are part of the *gomi* problem in Japan. While some of this can be tied to the Western-style consumerism of modern Japan, as well as to the high cost of waste disposal, the practice is too pervasive to blame entirely on imported cultural values. It may well be that, in the Japanese concept of humans as part of nature (Bernard's "fluid boundary"), human-fabricated items are part of nature, too.

On the positive side, the Japanese have a high propensity to recycle. Rates of recycling in Japan are well above 50 percent for paper, glass, and steel and aluminum cans (Environment Agency, 1995). Recycling efforts are strong due to the scarcity of natural resources, but they are also aided by the relative abundance of recyclable materials resulting from the high population densities in residential areas. Tied in neat bundles and stacked curbside, huge volumes of paper waste can be gathered on an economical basis.

Despite their environmental concerns and despite the heavy emphasis on group activities in Japan, or maybe because of it, Japanese environmental groups are generally small and highly fragmented. There are few national-level environmental interest groups. The bird watching folks of the *Nihon Yachou no Kai* are the strongest, with about 50,000 members, but their interests are primarily avian. The smaller groups are local in composition, with fairly narrow interests. They often focus only on issues that impact them directly rather than on broader environmental concerns. Occasionally, more self-serving motives are cloaked in environmental terms. These groups rarely communicate or coordinate with each other, even if there seems to be common ground. By way of contrast, these small groups have a large presence on the Internet and often provide English versions of their websites.

Beyond this fragmentation and self-interest, other factors have hindered the effectiveness of Japanese environmental groups. Historically, the groups have been largely comprised of women and women have lacked political power. Men have made up little of the active membership, not because they are unconcerned, but because the demands of their jobs leave little time for environmental activism.

The effectiveness of some of these groups was further hampered in the 1980s when leftist political groups championed environmental concerns. The "greenness" of the Reds often had more to do with attacking the government controlled by the conservative Liberal Democratic Party (LDP) than with any deeply held convictions about environmental protec-

tion. Therefore, leftist support made it difficult for the LDP government to accept the sincerity of environmental groups and the causes they supported.

Managing the green forest

In addition to examining aspects of Japanese environmentalism, we also need to explore several facets of the forest and forestry. The domination of the landscape by forests and the domination of forestry by a highly trained professional cadre of foresters are critical concepts. We must also study agency programs and problems, as well as public participation in forestry activities, to deepen our understanding of the Japanese relationship with this green resource.

Statistics and square meters

Nearly 70 percent of Japan is forested (25.21 million hectares). Of that total, 10.33 million acres are artificial forest, mostly plantations of *sugi* (*Cryptomeria japonica*), *hinoki* (*Chamaecyparis obtusa*), and *karamatsu* (*Larix leptolepis*), representing 40 percent of the total land area. (*Sugi* and *hinoki* have been the two most important timber species in Japan for centuries.) No other nation has devoted some much land to plantation culture (Japan FAO Association, 1994).

The high percentage of plantation is connected to the long history of plantation culture described earlier and to a tremendous post-war planting effort. Huge areas of Japan were stripped to provide material for the Pacific War. In the immediate post-war years, tree planting was a priority. The resultant plantations are now a key feature of the landscape. In almost every scenic mountain vista, the conifer stands that are visible are plantations. As this artificial forest matures, some analysts expect that it will play a more important role in meeting Japan's future timber needs. However, I concur with other researchers (Tanaka et al., 1998; Robertson and Waggener, 1992) that such obstacles as labor supply and cost, declining public investment in timber management, and a growing societal preference for something more than timber from the forest will limit Japanese timber self-sufficiency.

The success of forest recovery does have its downside. First, in some higher elevations, the forest floor beneath the *sugi* supports little or no vegetation. Light penetration through the canopy of a maturing plantation is quite low. Moreover, *sugi* needles do not decompose readily. As a consequence, soil erosion can be a problem. To reduce soil erosion on fragile mountain soils, there are now restrictions on establishing plantations above certain elevations in some regions. A second interesting feature of plantation success is that, as allergy sufferers, even in distant cities, are well aware, *sugi* and *hinoki* produce massive quantities of pollen every spring.

Japanese national forests account for 30 percent of all forests and 20 percent of the nation's land. They are managed by the Forestry Agency, which is a division of the Ministry of Agriculture, Forestry, and Fisheries. By way of contrast, US national forests cover less than one-tenth of the national landscape, but measure twice the land area of all of Japan. Private individuals, corporations, and temples own about 60 percent of the forest; prefectures, municipalities, and villages own the remaining 10 percent. There are 2.4 million individual private owners and their average ownership is 2.6 hectares. Seventy-one percent of these private owners belong to associations or cooperatives that provide management and marketing services (Japan FAO Association, 1994). In isolation, these facts are not important. However, for a nation the size of California with six times that state's population, the statistics help explain the scale and intensity of resource management.

Japanese foresters pay a lot of attention to detail and are very exacting in their mapping, planning, and management. The thoroughness with which the Japanese classify and demarcate the subtleties of land vividly contrasts with their comfort in vagueness and implicit meaning in communication. For example, there are countless ways of saying no without ever saying "No," but the uses of land are precisely described.

Not satisfied with "protection forests" as a broad land class, the Forestry Agency has seventeen types of protection forest. These include protection forests for headwaters conservation, soil run-off prevention, soil-failure prevention, and rock-fall prevention. There are seven additional classes of Protected Forest within the National Forest system to provide for various aspects of conservation biology.

Maps are a national obsession. Partly because Japan has virtually no street signs, and a nonlinear building and house numbering system, nearly all drivers have detailed maps stored in their car for getting around in their own city. In forestry, detailed maps are common and the mapping units are much smaller than those employed in the more extensive management situation in the US. Mapping, data collection, and silvicultural planning are done for management units as small as 0.10 hectare.

The degree of control that the Forestry Agency and prefectural forestry offices (equivalent to state forestry services in the US) have over private land is quite strong compared to their American counterparts. The protection forest designations listed above apply to all public and private forests, not merely

to the national forests. While private landowners do receive compensation when their management options are severely restricted, the public agencies have fairly broad discretion in implementing forest policies. When a landowner wants to change land use, there is a certain amount of give and take with the responsible agency, but mostly the landowner gives. One prefectural official told me that 100 percent of all requests for permission to do something new with land were approved. He quickly added that 100 percent of those that would not have been approved had been graciously withdrawn prior to final deliberations.

Another example of compartmentalization in Japanese resource management is the demarcation of responsibilities among agencies. As is the case in the US, there are separate national bureaucracies for managing national forests (*kokuyurin*) and national parks (*kokureitsu koen*). The Forestry Agency (*Rinyachou*) is responsible for the management of all national forests. The Environment Agency (EA) manages the national parks. In Japan, however, the national parks are actually physically embedded in the national forests. Nearly 2 million hectares of national forest are allocated to national park use. The Environment Agency is responsible for managing visitor facilities in the parks; it is not responsible for managing the land not directly related to visitor use. In the US context, it would be as if the campgrounds in a national forest were assigned to the National Park Service, an agency of the Department of the Interior, while the balance of the land mosaic remained under the purview of the Department of Agriculture's Forest Service. Americans could not imagine Yellowstone National Park with a divided jurisdiction, but the Japanese see both promise and problems in their approach. Certainly it reduces competition among agencies, because each has its own mission. On the other hand, the structure reinforces the compartmentalization so evident in other resource management aspects.

The arrangement leaves recreation and other Environment Agency concerns in a weak position relative to timber production. The Environment Agency is much smaller and largely dependent on the goodwill of the Forestry Agency to accomplish its recreation goals. Moreover, middle and upper levels of the Environment Agency's management are often comprised of bureaucrats on loan from other ministries (Agriculture, Transportation, and Construction). They bring with them the culture of their parent agency and are mindful of their impending return. Few will take positions against the desires of their past and future colleagues on behalf of the weak Environment Agency.

Human Green Plans

While Japan has begun to deal with the negative affects of industrialization and environmental degradation, it faces a dilemma in how to protect and conserve forest values and provide for the economic and social well being of rural areas. Their conflict between forest-based economic development and nature preservation has its parallels in rural North America.

The post-war industrialization of Japan created employment magnets in the coastal cities, drawing young people from their traditional villages in the mountains. The depopulation problem (*kaso*) was exacerbated by the shift to petroleum from charcoal and wood energy. Charcoal production had been a major source of employment in the villages (Mitsuda, 1990).

Now, with the recognition of the value of nontimber resources, forests can help the redevelopment of rural village economies. At the national level, *Human Green Plans* are focusing on using the forest setting for economic revitalization. Typically, these plans use the forest for developing year-round recreation facilities and ski resorts. Some observers criticize these efforts as promoting relatively low paying service sector jobs, but given the general decline of rural areas, a service job is better than no job. These developments do have negative impacts on the environment. New highways, ski areas, and tourist accommodations require that some portion of the forested landscape be sacrificed. To their credit, the Forestry Agency is keeping new ski areas out of the high elevation natural forest. (The beech trees that grow in these high elevation forests have become a symbol for environmental groups.)

Because most of these projects are capital intensive, railroad companies dominate the ranks of investors and developers. Some analysts have questioned how much benefit the local villages are getting from these projects beyond the wages paid. They suggest that most of the profits are flowing out of the region to the investors and to the cash strapped Forestry Agency.

The Forestry Agency: Land rich and cash poor

In the years following the war, demand for timber to rebuild the country was very strong and wood flowed in from around the world. The timber that survived the Imperial war effort became, thanks to the basic forces of supply and demand, very valuable indeed.

At first, the Forestry Agency was awash with revenue from timber sales. The Ministry of Agriculture, Forestry, and Fisheries successfully lobbied to retain this money, rather than turn it over to the general treasury. They argued that timber could pay its own way; the costs of management could be covered from sales. For several years, this financing

scheme worked well; timber receipts generally did cover expenses from 1955 through 1975 (Uozumi, 1994). The opening of Japan's wood markets to low-priced US and Canadian competition in the 1960s generated downward pressure on domestic timber prices. Falling prices (and rising costs) have led to decreases in harvest volumes on public and private lands although demand for forest products has grown rapidly (Uozumi, 1994).

The decrease in market share and the increases in management and labor costs have turned the Forestry Agency's timber program into a fiscal disaster. To balance the books, the Agency borrows money from the Ministry of Posts and Telegraphs (The Post Office in Japan performs many nonpostal functions). Recent analysis shows that the accumulated debt is so large that nearly every yen borrowed is offset by the interest cost for the fiscal year. There is very little left in the loan to fund the timber program deficit, so the total debt continues to increase. In short, the Agency is insolvent. Nontimber programs are financed by the General Fund and are not subject to the same accounting procedures.

Despite the financial woes facing the national forests, the post-war forest is recovering. However, when it becomes mature enough for harvest over the next twenty years, it will not satisfy Japan's voracious appetite for fiber. And, as in North America, there is a growing societal demand for nontimber forest goods and services.

Complicating the domestic supply picture are management and labor costs. Plantation silviculture is very intense and expensive. It resembles the practices of the US South, except that it is conducted on steep terrain that is difficult to access. Despite good growing conditions and an abundance of two very desirable species, the invested costs and cost of extraction make it difficult to compete with wood from foreign countries. Net returns to public and private timber owners have been declining.

The Forestry Agency deficits are also linked to the high costs of unionized public employees who harvest national forest timber. In addition to the constraints of dealing with a powerful union, the Forestry Agency is further hampered by the productivity of that logging workforce whose average age is more than 55 years. That statistic is unlikely to improve because young people see logging as dirty, dangerous, and dull (in Japanese, the alliteration is with a "k" sound) and would rather work in a high-tech factory in Tokyo.

The war on gravity

With a steep and unstable topography, the Japanese have been engaged in a long and expensive war against gravity. Land failures related to natural circumstances or human use of the slopes have generated devastating landslides, mud flows, and floods. The chief weapons in the Japanese arsenal are check dams, revetments, and other engineered structures coupled with extensive reforestation and special forest management techniques. In the Japanese lexicon, forest conservation means activities designed to prevent land disasters (Forestry Agency, 1994).

Reforestation has been widely used as a soil and water conservation and land protection tool. For example, the mountain looming behind the port city of Kobe, was, at the beginning of the 20th century, a treeless heap of earth and rock that frequently sent some portion of itself into Kobe and neighboring communities. It had been stripped clean of vegetation to meet the fuelwood and construction needs of the city. In 1905, various levels of government sent hundreds of workers to construct narrow terraces across the face of the mountain and plant red pine (*akamatsu*) to begin the stabilization process. Today, nearly a century later, the mountain is blanketed in green. The terraces are invisible except to the forester's eye and natural vegetation has grown in under the protective boughs of the planted pine. Most of Kobe's citizens assume that the forest is natural.

With an expanding population, Japanese housing is creeping onto the steeper slopes near urban areas. An increasingly affluent society is also spending more of its time and money in mountain resorts. Second homes, ski chalets, new highways, new recreation facilities, and new living space translate to a need for more protection from landslides. Forestry agencies and other governmental units are spending billions of yen annually to build check dams and other protective measures.

Given this history of devastating natural disasters, it is not surprising that the Japanese public views soil and water conservation as among the foremost functions of forests. Sugimura (1993) found that, not only did Japanese citizens value the soil and water conservation services of the forest, but the demand for such services was stronger in those urban areas where there was a history of floods and landslides. Timber production is not seen as a high priority land use in Japan.

Beyond the conservation aspects of this unending struggle with gravity, there is the politics of public works. These construction projects are not unlike the US Congress' pork-barrel appropriations that funnel money into politically powerful rural districts. Construction of water control devices, check dams, and road protection facilities are often as much a rural economic development undertaking and employment measure as a resource conservation policy. Some of these efforts may ultimately prove to be a net environ-

mental loss, as have been many Corps of Engineers' dams or Soil Conservation Service's stream channelization projects in the US. This massive spending by the government on all types of public works including conservation has failed to invigorate the economy and has contributed to a budget deficit that is larger than that of the US as a percent of Gross National Product or of government spending.

The culture of public participation

When US foresters talk about public participation, they are usually referring to direct public involvement in decision-making processes. The Japanese concept of public participation in forest planning is different. The public's chief roles in Japan are that of volunteer data gatherers and laborers. For example, in the Third National Survey of the Natural Environment, over 100,000 people collected data for the Environment Agency related to species distribution and abundance (Environment Agency, 1989). Tanaka et al. (1998) indicates that non-governmental organization volunteers are essential for the data-gathering component of public forest planning. City neighborhoods are organized into groups to plant and care for trees. Youth groups and company employees take charge of tending publicly-owned plantations and suburban young second growth forests (Shigematsu, 1991). Conservation volunteerism is clearly an important social activity in Japan.

One interesting feature of public participation is the direct investment of citizens' private money in public forest plantations. Citizens can invest directly in the plantation, providing cash for intermediate stand treatments, in exchange for a prorated share of the proceeds upon harvest. With the high costs of wood and the pressure of foreign competition, the profit levels on these investments are low and somewhat distant from today's investor. There is, however, a sense of doing something to benefit the forest and future generations that outweighs the findings of discounted cash-flow analysis.

The Forestry Agency is only now experimenting with public participation in forest planning. The US Forest Service has been working at this for 25 years or more, so that there is an increasingly broad base of citizen participation in formulating and evaluating alternative plans.

The national forests of northern New England have, over the years, been particularly successful in engaging local citizens to help create plans that balance the timber and non-timber demands of the region. That success can be partially attributed to a regional culture in which a town meeting approach to public decision-making expects substantive involvement by local people. While national forest public participation processes are highly proscribed by various federal laws, New England participants are accustomed to working with public employees, engaging in spirited discussions, and reaching consensus.

The current American system is not flawless. There would indeed be problems with adopting US methods in Japan, with its history of top-down decision making. Local people and interest groups are generally unaccustomed to this type of participation. Japanese resource managers generally feel that local preferences are best expressed by local elected officials on behalf of their constituents.

Japanese resource agencies are in the best Confucian tradition of a decision making elite. This heritage predates the Meiji Restoration (1867) and continues to this day. In addition, professionals trained largely at elite institutions such as the University of Tokyo and the University of Kyoto staff these agencies. The brightest and the best enter government, rather than corporate ranks. Being a bureaucrat in Japan holds the same prestige as in France or other European countries; the word is rarely used pejoratively, as it is in the US.

A similar system was in effect during the American Progressive Era and beyond. American resource managers, armed with the scientific method and professional credentials, made the management and policy decisions affecting natural resources. Our embrace of broad-based public participation for public forest planning is a relatively new idea. The concept of forester as esteemed *forestmeister* is gone from the American scene, but the deference given to the professional elite remains in Japan.

American public resource agencies and private companies have embraced new approaches to resource management, and related university curricula are now very broadly based in most cases. Japanese universities and agencies have undergone similar changes, although I sense less integration and less attention to holistic treatment of the forest ecosystem. On the other hand, the Japanese may be better able to elevate nontimber forest resources to equal standing with timber than their US counterparts.

At times, it seems that Japanese resource agencies are too inflexible to meet the challenges of a greater demand for public participation. There is only a weak tradition of public participation, and their initial attempts to foster more suggest they have not abandoned the elite approaches of the Meiji bureaucrats. On the other hand, there is a cultural clue that perhaps they have come to grips with the key management issue of the 21st century: how to manage the forest for more than just timber commodities. The Japanese have separated the forest management

world into timber and *green resources*. This suggests that green resources have a very positive connotation. That contrasts with the American dichotomy of timber and *nontimber resources*. Our negation says an awful lot about the relative power of the separation within America's forest bureaucracies, policy-setting bodies, professional organizations, and forestry schools.

How green will Japan's 21st century be?

Despite the best efforts at promoting "green," population and development pressures will reduce the amount of Japanese green in a spatial sense. The national obsession with golf, for example, dooms several thousand hectares of forest each year because approval for nonagricultural uses of farmland is very difficult to obtain. But, since what happens in the future is very much influenced by present trends and historic circumstances, Japan will be a greener, more sustainable society in the 21st century than it is today.

Green consumers

As a nation with limited natural resources, Japan already recycles certain materials to a very high level. With its population densities, it has a first-rate mass transportation system that reduces dependency on the automobile and ribbons of asphalt. But, with their high levels of demand and relative affluence, Japanese consumers have exported the negative aspects of forest resources management through their high reliance on imported timber.

The future demands of industrialized Japan will not be met from domestic forests. Currently, Japan produces only 25 percent of its demands. Logs and chips as well as lumber and panel products flow to Japan from Canada, the US, Latin America, Southeast Asia, and Siberia. Environmental groups have designated some Japanese companies as among the worst despoilers of the tropical and boreal forests. Some scars in the US Pacific Northwest and in Canada's British Columbia can be traced to Japan.

To be fair, the Japanese companies do make convenient targets for environmental groups seeking protection of tropical forests and publicity for their causes. The companies are large, not very reactive and easily painted with the epithet of multi-national corporation. The reality is that, while 25 percent of Japan's wood does come from Southeast Asia and South America, nearly 40 percent comes from North America (Japan FAO Association, 1994). While Japan does absorb 30 percent of the tropical wood on the export market, the problems of the tropical forest have more to do with expanding populations and agricultural policies in the tropical nations themselves than they do with the Japanese appetite for wood.

Japan is also the primary source of funds for the International Tropical Timber Organization (ITTO). Yokohama-based ITTO is a treaty organization comprised of nations that either produce or consume tropical timber. Its goal is to shift the extraction of tropical timber from mining to management. While its successes are few, the underlying treaty is serving as a model for additional agreements on temperate and boreal forests.

Trade flows in expertise

Whatever shortcomings and advantages the Japanese may have in natural resources management and environmental protection, they are willing to share their knowledge with the world. Many prefectures provide forestry information in English. Kanagawa Prefecture, proud of its accomplishments, publishes very high quality literature for dissemination to non-Japanese readers. Similarly, the national resource agencies prepare dozens of reports, brochures, and other items in English.

In a more direct approach, the Forestry and Forest Products Research Institute, the research branch of the Forestry Agency, coordinates a large overseas outreach program. Nearly 300 national level scientists and managers were sent on overseas duty in JFY 96-97. This compares to almost none from the USDA Forest Service. The Japan International Cooperation Agency (JICA) has numerous environmental aid programs throughout Asia. Ozawa (1994) notes with pride that these programs are "quite large in scale, even in comparison with those of other advanced nations" (p. 149). There is also a well-developed program for bringing foreign natural resources specialists to Japan for training. The forestry agencies at both the national and prefectural levels are also continuing the tradition of the Meiji-era bureaucracy of sending its staff to see what was happening in other parts of the world and by bringing foreign specialists to Japan.

Public participation and education

The mix of functional responsibilities among resource agencies requires effective interagency communication. This seems to be working and there is accommodation among the Forestry Agency, the Environment Agency, and the prefectural governments. Yet, communication external to the agencies is rather stiff and largely from the top down.

The key seems to be helping provide a forum for more effective dialogue between various citizen groups and the resource management agencies. This seems to be a fruitful direction, although it will be difficult due

to the Confucian traditions of deference to the elite authoritative bureaucracy.

Unlike their US counterparts, Japanese agencies still set the agenda for environmental protection and forest resource protection and management. They set the goals and provide the leadership to attain them. In this regard, these agencies resemble the US Forest Service and US Park Service in the American Progressive Era or the Environmental Protection Agency in the early 1970s. As they reap the harvest of environmental awareness and resource protection that the agencies are now sowing, the Japanese public will want a larger role in setting the green agenda. How will they do this?

The rough and tumble give and take of a New England town meeting is not likely to be an ideal toward which Japan should aim, but neither is a retreat to Meiji-style decision making by a bureaucratic elite. As always, Japan will find its own way, borrowing the threads of good ideas from elsewhere and giving them the special twist that make those notions fit the fabric of Japan.

The Japanese educational system has made concerted efforts to expand the level of environmental education in the schools. By working at the younger ages, there will be greater awareness in the next generation on environmental and resource protection issues. Academic material on the environment, forestry, and forest products appear in textbooks at all levels. And, while visits to important historical and cultural centers are common, visits to national parks and other outdoor settings are becoming more popular. Natural history as study topic is gaining ground on national history.

Environmental education is not restricted to the classroom or to school-aged children. Aichi Prefecture, for example, has a green education center that provides information to schools, citizen groups, and local governments on tree and landscape management. There is also a national level forestry instructors certification program to credential lay people who want to teach others about nature.

What does society want?

Thanks to their increasing affluence and the success of institutionalized environmental education, Japanese society will want greater emphasis on nontimber resources. Moreover, economic wealth has provided the means to address the environmental damage wrought by industrialization. Japan has long demonstrated its willingness to fund significant investments in soil and water protection and timber production. Given their high standard of living and wealth, they are ready to invest more into the protection of the environment and of the forest.

And the citizens want it to happen. Setting goals and then marshaling the resources to achieve them is a fundamental characteristic of Japanese social action. As Williams (1994) observes, "Japanese public policy, old and new, cannot be understood without reference to this philosophy" (p. 11). The recovery of the forest after pre-industrial and industrial devastation is ample evidence of the effectiveness of that social process. After centuries of forest exploitation, Japan's mountains are nearly as tree-covered today as they were in the early days of civilization.

Greater public participation in environmental decision making will also mark the 21st century. Agency shifts to promote more public participation is not merely window dressing, but a sincere effort to deepen public consciousness of environmental issues (Ozawa, 1994). And, as described above, these citizens will be more aware of environmental issues and more supportive of green resources management.

There are changes happening in agency culture and in the academic training of foresters that bode well for the future of Japanese forests. Green resources management is seen as an important professional responsibility within public agencies. At the university level, more attention is focused on teaching and research related to non-timber resources. Planting these seeds of "green thinking" over the next few years will provide a bountiful harvest of green resources in the decades to come.

Japan is developing an understanding of the costs of industrialization. It has demonstrated a willingness to share those lessons with others and to ask for insights in dealing with its own problems. I agree with Ozawa (1994) that Japan will play a major role in bringing environmental know-how to much of Asia. The emerald archipelago has served as model to many Asian nations in economic development; it may well play a similar role in the re-greening of Asia.

Note

1. Scientific Contribution 1992 from the New Hampshire Agricultural Experiment Station.

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