# Influence of Nature, Policy and Thoughts on Environmental Ethics in Japan: Maintenance of the Forest and the Ecosystem in the Edo period

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## 1. Introduction

JAPAN was referred to from the world as a developing country of pollution from the 1960–1970s. This reference was due to symbolic pollution issues such as Minamata and Itai-itai (Ouch-ouch) disease episodes that had become well known around the world. Most of these pollution issues were, however, resolved in the late 1970s because of increased legal maintenance, although some legal hurdles still remained. In the early 1970s, public warnings of photochemical smog were announced almost daily, and rivers flowing into Tokyo Bay were polluted to the point of the disappearance of fish. Today, it is extremely rare for any warnings of photochemical smog announcements, fish have returned to rivers, and even salmon are expected to return.

The country of Japan can be proud of this extraordinary restoration in spite of once being considered a developing country of pollution. One of the symbolic cultural origins of the country that can be attributed to the successful restoration to ecological balance can be traced back to the social ecosystem, or environmental ethic that flourished during the Edo period (1603–1868) during the 17th to 19th century which cherished productive forests. The manifestation of addressing and managing pollution during this period in Japan is a wonderful case study for the world based on history.

The purpose of this report is to explore and extract, using two examples of forestry and material circulation, how Japan during the Edo period was able to succeed in overcoming pollution issues based on the natural climate and geography, policy, thought, and religion.

## 2. Maintenance of Healthy Forests

According to the 2005 FAO (Food and Agricultural Organization of the United Nations) report, forest coverage in Japan was proportionally

68.2% of the country area, and this value was second in the world next to Finland at 79.3%. However, this fact is not well known. Compared to the average world forest coverage of 30% coverage area, it is noteworthy that Japanese forest coverage is more than double.

However, Japan is not at all a world exception, particularly because of significant deforestation periods in the past. Historically, Japan has experienced two major deforestation periods[1]. One was during the national formative period of the 7–8th century. During this time, massive temples were built in the capital modeled after the Chinese Sui and Tang period, consequently reducing forest resources. The other time was from the Azuchi-momoyama period (1573–1603) to the first half of the Edo period (until about 1700). During this period, although forest resources were dramatically reduced, consciousness towards forest resources simultaneously increased. This was due to the sudden increase in demand for wood to build structures such as houses, temples, bridges and ships, as well as for combustible fuel and daily life sustenance accompanying population growth and urbanization. Therefore, forest coverage during that period was relatively lower than the present.

## 2-1 Influence of Climate and Biogeography

The country of Japan is latitudinally long extending more than 3,500 km from 20° to 45° North. Due to the relatively long geography from north to south, the climate zone stretches from subarctic climates of the north to subtropical climates of the south. Mountains over 3,000 m high spread through the volcanic geography like a backbone through the entire country. As a result, there are few plains and grasslands, the topography is geographically complex, and earthquake activity is extremely high. Further, the country is influenced by oceanic climate, belongs to the monsoon-influenced region of Asia, and embraces four distinct seasons. Precipitation is relatively high throughout the country with an average of 1,700 mm/year due to high temperature and humidity during the summer. In fact, precipitation is more than double that of other countries belonging to similar middle latitude regions. The culmination of the geography, climate and precipitation allows for high plant diversity as well as relatively fast regeneration (20–30 years) of forests. Thus, it is not unusual or unrelated that the Japanese have taken such good care of nature based on this rich biogeography.

As mentioned before, there are few plains and grassland in Japan, and most of the plains have been utilized for rice farming since the Yayoi period (B.C.3–A.D.3 century). Rice field cultivation is limited to plains because of the requirement of water. Volcanic mountainous areas are

unsuitable for rice fields due to steep inclines while forest areas are also difficult to cultivate even after deforesting. Interestingly, vital rice farming and Japanese agriculture can be considered one of the key factors which helped protect forest areas and other ecosystems. History suggests that there was a strong coupling between successful and effective rice farming on limited land, and the conservation of forests in Japan due to limited resources and complex topography.

### 2-2 Policy of the Edo Shogunate

Conrad Totman (1998)[2] and Hiroshi Kito (2002)[3] discuss and connect the policy of the Edo Shogunate to forest maintenance in Japan. For example, the Edo Shogunate officially announced 'the agreement of rivers and mountains for countries (*Yama-kawa-okite* in Japanese)' to the chief administrator of the country as a policy that regulates deforestation and the policy to plant new trees. This agreement completely forbid the taking of trees and plants which helped prevent soil and sand erosion, and recommended planting trees on treeless mountains. Moreover, the Shogunate enforced severe regulatory rules that forbid deforestation (*Tomeki*) and entrance to forest areas (*Tomeyama*), and limited forest use by dividing particular forest areas into limited use (*Yoriyama*) and limited use periods (Nenkiyama). Thus, Totman (1998)[4] notes that Japan succeeded in switching from plundering-like forestry to sustainable forestry ahead of the world in the 17–18th centuries.

### 2-3 Influence of Thought and Religion

Takeshi Umehara (1995)[5] suggests Japanese culture has developed two social views of environmental conservation and ethics based on philosophical belief and religion since the Jomon period (B.C.140–B.C.3 century). The first ethical view is that human beings are one type of animal amongst all living organisms including plants, and that all living organisms are equal having the same life. In other words, human beings are not an exclusive living organism. This concept of the human existence is seen in the Shinto religion that is the native faith of Japan. In the Shinto religion, the divine dwells not only in trees, plants and animals, but also in non-living entities such as mountains, rivers and rocks. The belief was tied to the original Buddhist concept that 'all living beings have the Buddha-nature (*Shitsuu-bussho*),' and before long, the concept became the evolution of Japanese Buddhist thought. As a result, the concept that "mountains, rivers, plants and land can attain enlightenment (*Sansen-somoku-kokudo-shikkai-jobutsu*)" had characterized Japanese Buddhism.

Umehara (1995)[6] describes one more important concept which was embraced in Japan where all life and material are considered to be circulatory, repeating life and death. The life-circulation concept is still celebrated today through a religious event where human beings exist as souls after death, returning annually during the 'Lantern Festival (*Urabon*)' and equinoctial week (*Higan*). Umehara (1995) suggests that on the basis of these two ways of thinking, we can better understand how Buddhism evolved upon entering Japan from China.

Buddhism and Shinto philosophy likely had a measurable impact on the conservation and preservation ethic of forest land in Japan. Therefore, let us examine this hypothesis more closely.

1) 'Mountains, rivers, plants and land can attain enlightenment'

The concept that 'mountains, rivers, plants and land can attain enlightenment' does not derive from Indian Buddhism. This is because plants are not included as sentient beings in Indian Buddhist philosophy. However, Indian Buddhism never downplays the existence of plants. For example, Shakyamuni attained enlightenment under a Bodhi (pippala) tree, and the lotus flower is commonly found throughout Buddhist scriptures. Plants such as the Bodhi tree and the lotus flower are analogous symbols of Buddhism, where the Lotus Sutra is said to be 'the scripture of the right teaching comparable to a lotus flower[7].' Originally, the thought of the 'mountains, rivers, plants and land can attain enlightenment' appears to have come from the "*Dai-jogen-ron*" of Kichizo (549–623) from the Chinese Sanron Sect[8]. However, this concept did not gain very much traction in China, and is thought to have particularly flourished in Japan due to the rich natural features of the country. As an outcome, this concept broadly influenced the literatures, arts, and entertainment during the Middle Ages in Japan across the frame of Buddhism[9].

In Japan today, the beginning of flowering cherry blossom trees in the spring, the beginning of autumn colors or color change of leaves in the fall, and the songs of insects in during autumn are commonly reported on television. In this way, the transformation of nature through the four seasons has a significant influence in cultivating environmental sentiment for the Japanese, and manifests the concept of 'mountains, rivers, plants and land can attain enlightenment.' In other words, the rich natural environment and beautiful seasonal transitions in Japan have enhanced an 'ecocentric' culture originally founded on the Shinto belief that the divine dwell in everything. Further, it is understandable that a country could develop a strong affinity towards the concept of 'mountains, rivers, plants and land can attain enlightenment' where all

grass, plants, sounds of birds and songs of insect become a Buddha. This is one of the fundamental concepts of Japanese culture which has had a profound influence on forest conservation and maintenance.

2) Concept of Life-circulation

Japan has four distinct seasons where expansive deciduous broad-leaved trees express clear natural transitions. All of these trees lose their leaves in the fall and winter, and are analogously viewed as annually losing life in the process. In spring, the trees and fields vibrantly bud and blossom all at once, are exceptionally beautiful, and it is marked as a time to greet a new year of fresh green. In addition, animals and insects that awake from hibernation in spring appear out of nowhere. The annual transition from cold, seemingly lifelessness, to vibrant seasonal greenery visually and aesthetically repeats and supports the phenomena of life-circulation. The seasonality also reinforces the concept for the Japanese to pray for successful reproduction of farms, protecting broadleaf trees to enjoy autumn colors, and grieving the loss of coniferous forests.

In the "Brahma-net Sutra (*Bon-mo-kyo*)[10]," one of the Buddhist scriptures, there is a description that 'all the sentient beings in the six worlds (*Roku-do*) are my parents … all the earth- and water-elements are my prior body, and all fire- and wind-elements are my main body' where the reincarnation of life in Buddhism includes not only the six sentient beings but also the non-sentient beings of earth-, water-, fire- and wind-elements. Therefore, in Buddhism, there is the concept that non-sentient beings also circulate in addition to the circulation of life as conceptualized in animals and trees in the Shinto religion. What is the commonality between Buddhism from India and Shinto in Japan? It is the forest. In other words, the evolution from Buddhism to the Shinto faith from ancient times find commonality grounded by the forest, and the blended resemblance has become the undercurrent ecocentrism of the Japanese people. Since destroying forests analogously suggests the demise of oneself or human beings, vibrant forests must be preserved in Japan. The ancient Indian King Asoka (reign 273–232 BC) who respected Buddhism and provided good governance proclaimed that all citizens should plant a minimum of five trees in their lifetime and look after them, and he referred to the concept as the 'grove of five trees (*panchavati*)'. Therefore, the practice of planting trees and conserving forests in Japan are conducive to the proper practice of Buddhism.

## 3 Environmental Ethics of the Edo period

The ecosystem in Edo city (Tokyo at present) is described in detail in many books, *i.e.*, "White paper of environmental recycling society (in Japanese)[12]" which the Japanese Ministry of the Environment published (2008), "Just Enough: Lessons in living green from traditional Japan" by Azby Brown (2009)[13] and "Edo is the developed country of environmental issues (in Japanese)" by Hiroshi Kito (2002)[14].

### 3-1 Circulation System during the Edo period

Edo city, surrounded by Edo Bay (Tokyo Bay at present), was comprised of fishing villages, city-center areas, agricultural areas, transition-woodlands near populated areas (*Sato-yama*), mature forest area and some relatively big rivers passing through all of them. Edo city, where the population was one million or more, was a world eminent big city from those days. The massive city was established based on two large circulating systems of food resources and enormous waste. One circulatory system linked the transition-woodland near populated areas to the agricultural and city area. Maintenance of fertilizer to use in rice and vegetable fields was extremely critical for the agricultural villages. One type of fertilizer was compost derived from fallen leaves gathered from the transition-woodland near populated areas for agricultural villages, but this fertilizer was not enough. The deficit was balanced by utilizing large quantities of human waste emitted from the city, and ash from firewood used for fuel. Actually, the combined human waste and ash were quantitatively superior fertilizers, thus, the material was frequently transported to agricultural villages around Edo city. Subsequently, the circulated vegetable and rice products were returned to the city area of Edo again, and recycling was established.

In addition to this effective circulation system, there was a second major circulatory system that linked the mature forest area, fishing villages, rivers and Edo Bay. At the time, there were rich mature forest areas around the Kanto region including the Edo city area. Nutrients seeped from the mature forests and fertilized fields, and were carried to Edo Bay by several rivers flowing into the bay. This natural enrichment enhanced productivity of phyto- and zoo-planktons, fish, seaweeds and shellfish. The supplemented marine products of the bay were harvested in the fishing villages, and were consumed in Edo city. Also, the internal organs and bony parts of the fish that did not sell in markets were accumulated and carried to the agricultural villages around the region to be utilized as fertilizers. The second circulation system was established

in this way.

The intricate circulation systems during the Edo period were highly specialized for healthy environmental maintenance, and are considered ideal models for today's necessary recycling society. The Edo model has also been paralleled to the idealized 5Rs (repair, reuse, recycle, rental, reduce) in modern society[15]. For example, during the Edo period repair was performed by specialists who fixed tableware, lanterns, umbrellas, pans, knifes, etc.; reuse specialists were also available who creatively developed new utilities from old barrels, old clothes, footwear, etc.; the concept of recycle was found in rice production where the chaff, leaf, and stem were used for compost and ash, as well as rice as food. In addition, there were merchants who sold human waste and ash; rental was represented in the form of rental bookstores with approximately 650 stores in Edo city alone[16]; reduce was expressed in the form of the culmination of repair, reuse, recycle and rental where final discarded waste was extremely small, subsequently leading towards an extremely efficient society where resources were conserved.

Moreover, the fertilizer production from human waste was managed sanitarily within the circulation system of Edo, and people in the agricultural villages basically lived with self-sufficient lifestyles. Human waste that transmitted the epidemics of the plague and cholera in European cities during early modern times was effectively alleviated through appropriate processing in Japan. Thus, outbreaks of similar epidemics from human waste were not prevalent. More specifically, a particular method to convert human waste was utilized and called the 'night-soil reservoir[17].' The night-soil reservoir was very simple comprised of a cover for a dug hole located beside a field with added rice straw. Today we call this method anaerobic composting that not only transforms human waste into nutrient rich fertilizers from microbes, but also reduces disease-causing germs and parasites through the heat generated by chemical reactions. Thus, human waste was managed sanitarily during the Edo period. The self-sufficient life of the farmer was also conducted where the main food staple such as rice, vegetables, miso and soy sauce were homemade, the energy source was obtained by leaves or branches from the transition-woodland near populated areas, and water was used in the neighborhood from community wells. In this scenario, almost all basic materials, excluding household articles of cotton for cloth, metal, porcelain, and salt that were supplied from the surrounding villages, were readily accessible within self-sustaining households and communities.

### 3-2 Natural Environmental Conditions during the Edo period

The climate during the Edo period was during a period when the planet was relatively cold (1–2 centigrade lower than the present) commonly referred to as the small glacial epoch. Further, active eruption of volcanoes such as Mt. Fuji and Mt. Asama, as well as major earthquakes occurred in succession during the period. The relatively cold temperatures and natural disasters likely had a large impact on farm products. The difficult geography of narrow plains and limited resources in Japan, coupled with the conditions mentioned above must have been particularly severe during the Edo period. Therefore, the aggravation of natural conditions might have motivated the society to save, regenerate and circulate resources more effectively.

### 3-3 Policy for Circulation by the Edo Shogunate

The Edo Shogunate proposed various policies for the development and management of the circulation systems[18]. Above all, various kinds of technologies and methods for garbage disposal are necessary to resolve potential problems in big cities. In the early Edo days, garbage and waste was abandoned underground, in empty spaces, in rivers and moats, but there were obviously problems with odor, mosquitos, and flies. Therefore, the Shogunate proposed a 'town notice' that forbid dumping garbage in vacant lands in 1649, and appointed a specific place for the garbage disposal in 1655. By 1662, methods and structures (primitive methodologies) that processed and treated garbage was in place. Later, during the middle Edo period, a three-process garbage disposal method was established, *i.e.* collection, transportation, and disposal. In addition, strict prohibition of waste disposal in rivers, which corresponds to a measure of modern illegal dumping, was formulated by 1699. Moreover, the Shogunate instructed the establishment of large septic tanks for human waste in public rest rooms for effectively collecting excrement.

### 3-4 Thought and Religion during the Edo period

The "White paper of environmental recycling society[19]" and Brown (2009)[20] pointed out the ideology of '*Mottai-nai*' and 'knowing satisfaction (contentment)' as valuable lessons and mental attitudes that enabled the success of the circulation of resources during the Edo period.

The late, Dr. Wangari Maathai who received the Nobel Peace Prize has spread the concept of '*Mottai-nai*' throughout the world by campaigning environmental protection and women's rights. Originally,

'*Mottai-nai*' is derived from a Buddhist concept. Since '*Mottai*' indicates 'sacred intrinsic dignity of an entity,' adding -nai to form '*Mottai-nai*' expresses the opposite as 'not (having) sacred intrinsic dignity of an entity.' That is, it is a word that attempts to expresses the true spiritual value of something (virtue), suggesting that it is wasteful, or sacrilegious to discard something which has intrinsic dignity. Another way to explain the term '*Mottai-nai*' is to imagine that all objects, material or resources are endowed and deserving of their full potential, and even feeling pity or sorrow for the resource if not making full use of its potential. Consequently, concepts such as '*Mottai-nai*' have a powerful impact on the psychology and cognitive understanding of the value and consumption of resources. Indeed, the "White paper of environmental recycling society[21]" introduces by reference the clear recognition of how the samurai attained and lived during the Edo period respecting the true spirit of '*Mottai-nai*'.

The other important ideological concept practiced during the Edo period was 'contentment' or state of satisfaction. The term often has religious connotations in various cultures. In Eastern philosophies such as Taoism and Buddhism a similar concept is commonly found referred to as 'knowing satisfaction.' The "Tao-Te Ching (*Roshi*)[22]" of Taoism describes 'a person who knows contentment has true wealth.' The "Last Teaching Sutra (*Butsu-yuikyo-gyo*)[23]" from the Buddhist scriptures describes 'a person who knows satisfaction is happy, if he is lying down on the ground' and 'a person who does not know satisfaction is poor, if he has great wealth.' In other words, 'knowing satisfaction' is only possible when you understand and experience the opposite of *not* knowing satisfaction. For example, if we have great wealth and access to resources, we cannot understand the 'value' of the wealth. Oppositely, people who have limited wealth and satisfaction understand the true value of matters. Similar expressions and concepts are clearly found from Japanese Buddhists such as in "The essential collection concerning birth (*Ojo-yoshu*)[24]" by Genshin (942–1017), in "The treasury of the eye of the true Dharma (*Shobo-genzo*)[25]" by Dogen (1200–1253) and in "How those initially aspiring to the way can attain Buddhahood through the Lotus Sutra (*Hokke-Shoshin-Jobutsu-Sho*)[26]" by Nichiren (1222–1282).

The concept 'knowing satisfaction' also encompasses the virtue of understanding satisfaction with minimal resources. In other words, 'knowing satisfaction' also includes the discipline of 'desiring little and knowing satisfaction with little gain'. The concept of 'knowing satisfaction' from limited or reserved portions is critical for saving resources and living sustainable lifestyles.

Therefore, the concepts of '*Mottai-nai*' and 'knowing satisfaction' were active guiding principles of daily living for the people during the Edo period, and can be considered to have had a large role in forming the recycling-conscious society.

## 4. Conclusion

Buddhism was cultivated in Japan through the Shinto religion which recognized the rich natural resources of the country. The end result of the combined climate, biogeography, policy and philosophy allowed Japan to preserve and cherish forests, and develop an early ecocentric society. In addition, the circulation systems of Edo were likely developed on the basis of insufficient land, limited resources for the production of food for people in cities, as well as relatively cold climate conditions and natural disasters. It is conceivable that the concepts of '*Mottai-nai*' and 'knowing satisfaction' played an important role during the difficult period, and derived not only from natural ecosystem conditions but also from Buddhist philosophy. However, it is still difficult to confirm how philosophical concepts and religion may have influenced the development of the circulation systems during the Edo period. Although the Edo period was said to be a time when Confucianism flourished, it has recently been questioned whether this is true. Rather, it is thought that various philosophical concepts and religions laid the overall foundation for the hundreds of contending schools of thought. This is symbolized in the *Hotoku* philosophy, which was a fusion and compromise of Shinto, Buddhism and Confucianism, by Sontoku Ninomiya (1787–1856) who was a significant representative thinker during the Edo period[27]. In this sense, it may be appropriate that the concept of '*Mottai-nai*' and 'knowing satisfaction' are commonly included not only in Buddhism, but also in the cultures and religions of the greater Asia-Pacific region, and together with severe natural conditions, had affected the life and policies of the people during the Edo period.

### NOTES

[1] Conrad Totman, *The Green Archipelago; Forestry in Preindustrial Japan*, Univ. California Press, 1989.

[2] Ibid.

[3] Hiroshi Kito, *Kankyo-Senshinkoku-Edo* (in Japanese) [Edo is the developed country of environmental issues], PHP Institute, Tokyo, 2002.

[4] Totman, op.cit.

[5] Takeshi Umehara, *Morinosisou-ga-Jinrui-wo-Sukuu* (in Japanese) [Saving Human

Beings by Thought of Forest], Shogakukan, Tokyo, 1995.

[6] Ibid.

[7] Hajime Nakamura (ed.), *Bukkyo-Shokubutsu-Sansaku* (in Japanese) [Strolling of Plants in Buddhism], Tokyo-Shoseki, Tokyo, 1986.

[8] Fumihiko Sueki, *Nihon-Shukyo-Shi* (in Japanese) [The Religious History of Japan], Iwanami-Shoten, Tokyo, 2006.

[9] Ibid.

[10] *Bonmo-kyo* [Brahma-net Sutra] vol.2, Taisho-daizo-kyo, vol. 24, p.1006.

[11] Satish Kumar, *You Are Therefore I Am: A Declaration of Dependence*, Green Books, 2002, p. 89.

[12] The Japanese Ministry of the Environment, *Heisei-20-nenban Kankyo-Junkangata-Shakai-Hakusho* (in Japanese) [Annual Report on the Environment and the Sound Material-Cycle Society in Japan], 2008. http://www.env.go.jp/policy/hakusyo/h20/index.html

[13] Azby Brown, *Just Enough: Lessons in Living Green from Traditional Japan*, Kodansha International Ltd., Tokyo, 2009.

[14] Kito, op.cit.

[15] Kito, op.cit.

[16] The Japanese Ministry of the Environment, op.cit., and Brown, op.cit.

[17] Ibid.

[18] Ibid.

[19] The Japanese Ministry of the Environment, op.cit.

[20] Brown, op.cit.

[21] The Japanese Ministry of the Environment, op.cit.

[22] *Roshi* (in Japanese) [The Book of Lao-zi], Iwanami-Shoten, Tokyo, 2008.

[23] *Butsu-yuikyo-gyo* [Buddha's Legacy Teachings Sutra], Taisho-daizo-kyo, vol. 12, p. 1111.

[24] Genshin, *Ojo-yoshu* (in Japanese) [The Essentials of Rebirth in the Pure Land], Iwanami-Shoten, Tokyo, 2003. He described 'if a person knows satisfaction, he is wealthy even if he is poor. If he is greedy, he is poor even if he has great wealth.'

[25] Dogen, *Shobo-genzo Hachidai-ninkaku 2* [Treasury of the True Dharma Eye: The Eight Awareness of Great People, vol. 2], Iwanami-Shoten, Tokyo, 1990. He described the same sentences of *Butsu-yuikyo-gyo* after 'the second is knowing satisfaction.'

[26] Nichiren, 'How those initially aspiring to the way can attain Buddhahood through the Lotus Sutra' in *The Writings of Nichiren Daishonin*, vol. 1, Soka Gakkai, Tokyo, 1999, p. 880. He described 'A good teacher is a priest who is free from any fault in secular affairs, who never fawns upon others even in the slightest, who desires and is satisfied with little, and who is compassionate.'

[27] Sueki, op.cit.