Bioregional Practice for Forest Conservation: A Historical Comparison between Japan and Europe

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現在、世界の国々でそれぞれ自然破壊に関する問題が浮上し、解決策の考案が急務となっている。どの国にも、培ってきた固有の歴史と価値観があるわけだから、例え各国の大まかな方針は変わらずとも、具体的な方策はそれぞれに合ったものでなければ十分な効力を発揮できないだろう。そこで今回は、特に「日本の森林」に焦点を置き、その歴史的分析から、今の日本の森林問題に有効な具体策の提案を目的とした。結論としては、小規模経済領域の実現が、その一つの策として挙げられる。

本論文ではまず、「日本人のエコ意識」に対する世間一般的な認識について疑問を投げ掛けた。日本人は西洋人とは違い、古来より自然と調和して生きてきた民族であり、それは今も変わらないという認識は、全く根拠のないものである。そしてこれは、代表的な自然の一つである森林が、日本において無惨に放置されているという現実から考えられる推測であった。よって第三章においては、その推測をより強固なものとするため、よく対比して挙げられる西洋との森林史比較を行った。

比較を古代から近世にかけて試みた結果、日本はやはり西洋諸国と大差のない歴史を刻んでいたことが明らかとなった。たとえば、森林が権力の象徴として統治者に掌握された古代西洋と同様、日本畿内の森林は当時の権力者によって建築のために伐り尽くされた。また中世ヨーロッパで木材不足が問題視され始めたのに対し、日本の近世以降の森林もまた豊臣や徳川といった天下人によって全国的に採集され、ついにその需要を補えなくなった。しかし、その後も日本は特に積極的対策をとることがなかった。その結果、戦後「木材」のために大量に植林された山々が、今ではそのまま放置されている。

これら考察から、日本の森林問題を引き起こした根本的な原因として、次の二点が推察される。第一に、日本人がこれまで「今」必要なものを最優先し「将来」のことは二の次にしてきたという問題がある。このことは、昔から今まで一貫して、日本人がその時々のほしいがままに国内、ひいては海外の木材を手に入れてきた事実から言える。第二に、過剰な大規模経済の発達も要因に挙げられる。この要素には、先に述べた第一の要因を助長してしまうことに問題が

ある。歴史的に日本、西洋ともに権力者の支配領域・経済活動圏が広がるにつれ、より多くの資源を消費したという結果が存在するためである。

そこで以上二点をカバーできる試みとして、ここではバイオリージョナリズムを挙げた。バイオリージョナリズムは、必要物をできうる限り地域内で賄い、無駄な生産や消費を抑えることを目標とする。一例として、森の減少が目に見えて明らかだった時代の人たちは、先のことを考えて伐採を慎むようになったというデータがある。そしてバイオリージョナリズムは、言うまでもなく小規模経済活動を推進し、また地域の人が「将来」のことを考えざるを得なくするというメリットをもつ。さらに日本において、土佐の森救援隊といった活動団体が実際に多数存在することから、現実的にも無理のない方策であると言える。

したがって本研究より日本の森林を救うための一つの策として、第四章で示した真庭市のように「バイオリージョナリズムの実践により小規模経済活動を実現すること」が数えられるだろう。日本の森林面積は約七割であるのだから、地域内で木材を利用できる場所は少なくないはずである。バイオマス電気や家庭用ペレット、全国で広く使用される割り箸でさえも、本来は国内製材業によって出る木屑や間伐材で生産可能なのである。もちろん、できる限りそうするだけであって、域内に森林がなければ木材を使ってはいけないということではない。その場合も無駄な資源とマネーの消費を防ぐため、より近い地域から必要物資を手にいれる、ということは念頭に置くべきだろう。

本研究には、上に述べた「地域」の実質的区分や、既存林業からの脱却よりバイオリージョナリズムを普及するための方法、国家経済的な諸問題については、さらに今後の検討が必要である。しかし今回は、日本の森林問題の解決には地域内経済の見直しが有効である、という結論をもって本論文を締めくくることとする。

1. Introduction

It commonly happens around the world that a wrong reason is taken on blind faith to be a fact without the demonstration of causality. One of them would be the notion that Japanese people form a unique ethnic group that has historically lived in coexistence with nature. The evidence given here is that the major part of the land of contemporary Japan is covered by forests.

However, there is no connection between them actually. It is easy to understand

that the mainstream of the forest history of Japan is almost the same with that of the West, traced for each historical period. When a man of power would like to construct commemorative buildings, the wood for them was cut down thoroughly as much as he wants then. The aggression reached the ends of the country because of the lack of trees in nearby areas. The reason why plentiful forests are now left in Japan is because Japanese cedars and *hinoki* cypresses planted for meeting the excess demand before are no longer required and have been neglected with the start of free trade.

The points at issue seen from history are two: the disposition to think only of the present, and extra-large scale economic activity. Therefore, this thesis uses effective ideas of bioregionalism to attempt to solve these problems. Moreover, it is highly recommended to utilize forest products inside a region, as with the biomass power generation and wood pellet heaters being realized in an area of Japan. One solution for forest problems in Japan is finally proposed which lets people establish bioregional small-scale economies in each region.

2. Background

2.1 Actual Conditions and History of Forests in Japan

It is frequently mentioned that Japan is one of the countries whose proportion of lands covered by forests is quite large. That is because 70% of the country is covered with forests. More precisely, the country's total land area is 37 million ha, and the forest area is approximately 25 million ha (the Forest Agency, 2012). As well as Finland and Sweden, which are famous for maintaining a vast expanse of forests, Japan also has extensive forest lands when compared with other countries in the world.

Generally, it is basically highly praised to be abundant in forest area by reason that it is regarded as the proof that nation has engaged in about the preservation of nature. Actually, the present condition of forests in Japan is not so satisfactory as a lot of people believe. In fact, the 25 million ha of forest area contains about 10 million ha of man-made forests planted for timber production, where the principles of proper space between trees is ignored (Ando, 2012). Moreover, as the amount of wood needed to be cut from the forests has been decreasing since 1980, the trees that were planted earlier, when they were duly needed, are now neglected without sufficient thinning and management.

The forest area composed of immature trees is not able to perform at its full power, since the trees aren't growing into full-fledged mature condition. Each tree can absorb little CO2, and moreover, the soil conservation function of forests cannot work nicely which leads to landslide disasters' prone forest areas. This is the actual condition of forests in Japan. Deforestation is surely a serious problem in many countries, stimulated by countries that are destinations for export of woods, such as Japan, because in these countries it is not possible to use their internally produced trees which are of inferior quality and expensive.

According to Conrad Totman (1998), the forests of Japan have been neglected from around the 19th century, during the Meiji era, in Japan. The Meiji era is the period when Japan opened its ports to the world, and liberalized trade with European countries.

Before starting the free trade period, during the Edo era when the Tokugawa Shogun administered the country, it was barely possible to think of getting necessary resources from faraway places. People at that time had to fulfill their necessities with resources that were only produced inside their own regions. That's why each person oneself had no choice but to inhibit excessive logging, a fact which finally, led to the development of the original sustainable forestry management of Japan.

The regenerative forestry management consisted of a system which required a wealth of labor resources, which therefore causes a cost increase in lumber production. On the other hand, after the beginning of free trade, Japan came to import cheap wood from foreign countries. Consequently, the wood products from Japan's own country are no longer salable because of the loss in the price war of the free market competition. Since lumber doesn't sell any longer, a labor shortage for lumbermen has also been generated. As a result, forests in Japan have been ignored due to the lack of manpower and profits.

Thanks to decline of forestry in Japan, the plentiful lands covered by forests were reserved in roughly conditions. However, in contrast, Japan have let other countries cut down their forests more than necessary instead of supplying wood products from domestic forest area.

2.2 Reality and Ideal of Japanese People as an Eco-friendly Group

Most of the Japanese people would regard themselves as a special Asian ethnic

group which deeply loves nature and has harmonized living with nature from old times. This is clear from the example that follows. A questionnaire survey about religious views of nature for Japanese college students reveals that around 70% of them think "nature has greater power than science," and "I can be humble when facing nature." (Nishiwaki, 2004) Moreover, in the replies for the questions, "points for feeling proud about Japan" and "what do you feel is valuable in Japanese people," the response rate for "nature" is the seventh from over 20 alternatives, occupying 20% of all answers in the same research for university students.

From the results above, it becomes clear that many Japanese young people imagine that natural forces are superior to human control (science), and see nature with feelings of awe. That's why they expect that nature will never bend to any of human's wills in the end. In addition, they also believe that plentiful nature in Japan has been defended because of the Japanese original mind of respecting nature as a noble thing.

The opinion suggested above appears indeed to be persuasive, but it is not realistic enough, when verified against the actual situation of forests and forestry in Japan.

Sadamoto Watanabe (1997, pp.17), a doctor of forest ecology, states that "there are about 300 thousand plants on the earth, if counted only the discovered ones, of which 99.8% of them are found on land, and 90% of the land plants are living in forests. In other words, forests are a major source of biodiversity." It is obvious that for preserving nature forests deserve primary attention.

It is crucial for long-term successful forestry that forests become able to manage themselves by their own systems as many foresters came up with that. If the forests in a country are healthy enough, the owners could keep stable forestry management because of the valuable woods from their lands. However, the system of forests were already interfered and destroyed by humans in the world, actually in today's environment, it is impossible to recover the primary systems only by regenerative power of nature.

As proof of the above, Japanese forest industry has been obviously declining nowadays. The rate of self-sufficiency in wood production in Japan is only about 30%, and the rest, or about 70%, comes from foreign countries, such as Canada and Europe (the Forestry Agency, 2014). Two fifths of forests in Japan are artificial coniferous

plantations, which have been left without management and are under processes of deterioration. The wood from poor trees cannot be offered for high prices, as a result, the forestry in Japan is turning down. I would rather write that this is a consequence from a complex interaction of factors: beginning with the free market competition that leads to the lack of management of forests, and finally result in unhealthy forests.

Incidentally, there is a fatal misinterpretation that forestry is one major industry maintained only in developing countries, being proved the opposite in the examples of many Western developed countries. One such example is Canada, where forest products account for 10% of all the export products. In comparison, the rate of forest products for exportation in Japan is almost zero (Takahashi, 2009). Needless to say, Canada is called an advanced nation in forestry, meeting all of the internal demand for wood by its national production. More than 16 million ha of trees, which represents 90% of the forests cut down from 1975 to 2001, had been regenerated completely. Further, 85% of them had been restored only by natural forces, Takahashi (2009) argued. Other Western countries such as Germany, Austria, Sweden and Australia are famous for the sustainable forests as well.

What was mentioned so far is the social, economic and political problems seeming from the national standpoint. In addition, there are another impressive results from a survey about the common person's experiences of activities in a natural environment. In the research on people's consciousness about forests, the opinions of Japanese people are the following: (1) people usually don’t go for walks in forest lands, only ideally loving a stroll, (2) people wouldn’t like a direct experience in a natural environment but prefer a view of a tourist spot, (3) people prefer orderly made forest types composed of linear trees rather than native trees, etc. (Nishiwaki, 2004). From this, it can be concluded that Japanese people have less personal knowledge and experience relating to nature as it was, besides, rather just care for ornamental man-made nature.

Uniting what is revealed above, there is no actual way to verify that Japanese original thought is one that praises nature. Instead it is possible to perceive that there is just a spread vague notion that “Japanese people are a special ethnic group being able to harmonize with nature.” In order to discuss the above mentioned, in this thesis, at first, a comparison of the forest history between Japan and European countries will be carried out in order to make it clear what concepts or motives have let Japanese people use

forests in reality. In addition, investigating the issues Japan has, a specific possible way for saving forests in modern Japan will be examined.

3. Previous Research

3.1 Small-scale Use of Woods in Ancient Times

In Europe, the use of forests was actively conducted also in ancient times. More specifically, the ancestors of Alexander the Great monopolized the use of woods with their authority.

In "Wood: A History" (2011) written about the historical relationship between Europeans and forests by Joachim Radkau, there is also mention about the use of forests by ancient European people. According to him, kings had already understood the meaning of forests for their politics. At that time, the important keys for showing their power were shipbuilding and smelting metals. Both of these depended on the use of a vast amount of wood resources. From this reason, seen from regions around the Mediterranean Sea in those days, the center of political power had moved in order for searching new forest areas: ancient Babylonia, Macedonia, Rome, Spain, France and the British Empire, finally.

In short, tree felling had been already done by statesmen in old times mainly in order to keep their prosperity and authority even though that was still relatively small-scale compared with coming ages. As known from the fact that insufficiency of woods became a serious problem in Europe of the 16th century, any practical policy for taking care of forests would be hardly performed from antiquity down to the 16th century.

On the other hand, how about ancient forestry in Japan? Though the age is so different from the era of Macedonian dynasty, the times from Yamato Administration to Heian-kyo (the 4th – 8th century) when a man of power started ruling people in a systematic manner for the first time could be compared with the age of ancient Europe.

According to Conrad Totman (1998), a well-known historian of Japanese forests, the years from 600 to 850 AD was the ancient time of natural resources intensive exploitation. Most of the use of woods at that time was for building structures. Structures contained both earthly private buildings such as palaces and mansions of the ruling class and religious ones represented by temples and shrines. It is difficult to

estimate how many wood was consumed then, however, the amount was so enormous that the composition of forests in the Kinki region has changed completely because of logging, also affecting the very men who established structures for themselves.

It is impossible to infer the specific amount of forest areas lost during the ancient building boom. Something indubitable is that if a harvest of 450 cubic meters per 1 hectare can be gained from well-growing white cedars in central Japan, 900 ha of first-rate forests were cut down just for building Todai-ji Temple in Nara (Totman, 1998). Moreover, considering the fact that wood use for structures was extremely selective, and that almost all wood storage of natural forests is rarely uniform, the actual amount of forests logged would become few times higher than the number estimated above. Applying the number of 450 cubic meters to the total of temples presumably built, it can be thought that 90 thousand ha of white cedar forests were clear-cut. If the selective logging occurred, the amount would be much larger. Just for temples, huge forests had to be cut down. Besides, woods for priests, nobles, the emperor and officials are not included in that number at all.

Furthermore, the example written above is only that of wood for building. Moreover, wood was also widely used for canoes, vessels and carvings. Common people, also extensively used used wood as firewood and leaves and grasses for feeding. As a result, because all forests in Kinki area were felled down, it caused a shortage of timber. Nevertheless, the clear-cut of conifers ironically led to a lucky condition, giving rise to broadleaf forests which are useful for fuel woods and that grow fast. Thus, it fulfilled urgent needs of the increasing number of people living in cities. In addition, because the administrative power at that time was weak, the forest lands in areas other than Kinki were left abundantly (Totman, 1998).

However, what should be focused here is that ancient Japanese people in power and even ordinary people were just the same as ancient European people in the way they have historically wasted forest resources. To put it shortly, the historical reality proves that Japanese people in old times cut down forests in Kinki region thoroughly, putting an importance on benefit only for the present.

3.2 Massive Use of Woods by the Feudal System

In Europe of the middle ages, history documents that monarchs began to

reinforce forest management from what existed before by making a Forest Regulation, the national law in Germany around the 16th century. Although the administration by feudal lords originally was established according to the relationship between lord and vassal in feudalism, monarchs used Forest Regulation neatly, establishing ruled areas surrounded by clear lines in order to make their power extend to deep places in the woods. In this way, management of forest lands became a first priority in medieval Europe.

According to Joachim Radkau (2011), the rulers at that time sacrificed huge forests in the end because of the vast amount of wood demanded by the expanding mining industry and iron manufacturing. The monarchs in around 1500 powerfully intervened in the forest management of municipalities and Mark community having been taking care of forests, rangelands and swampy areas which had been from previous times. That is evident from the concrete complaint in the 12 requisition sheets of the riot by farmers in 1525 in which was written that their feudal lord had woods all to himself.

Forest management by statesman's side which was specified in the official document of Forest Regulation was frequently justified as a necessity for forest conservation. That was for convincing the pastoral tribes regarded as the people who made light of forests in the process of grazing. Surely, most of the farmers at that time felled trees in order to secure large pasture and meadow. Therefore, there was some truth in that, however, the perceptibly large-scale forest desolation in 16th century was actually accelerated by the administration interests which promoted mining and steel industry (Radkau, 2011). From this period on, therefore, a lack of lumber became a problem in real earnest.

In the meantime, in Japan from 16th century to 17th century, "timber depletion during the early modern predation" started, according to Totman (1998). It got basically increasingly more intense than that of ancient times. The governing classes began to demand the creation of magnificent structures and cities again, when the second boom of construction occurred. The difference from the first period was that the ruling classes of this time had absolute control over the land, moreover, they possessed the power to achieve the goal of exploiting the labor force and natural resources from all around Japan. That's why almost all woodland in the archipelago had been stripped during a century when building was prosperous throughout the land.

“Toyotomi Hideyoshi was the first person in Japanese history able to demand and receive massive contributions of timber from all parts of the country,” Totman (1998, pp.56) states. Toyotomi’s adherence to memorial structures was reinforced along the expansion of his possessions, ranging from the representative Osaka Castle to the residence of senior regents for sending troops, his own palace (*Jurakudai*), and the Hōkō Temple for reviving Kyoto. In addition, he made an effort to reconstruct the temples of the Tendai sect and the Shingon sect of Buddhism and so on; accordingly he spent large amounts of money in order to rebuild shrines and temples.

Ieyasu Tokugawa, the next administrator, as well as Toyotomi dominated forests, but surpassed the former one in an important point. Tokugawa promoted the improvement of transportation systems which accounts for the highest cost in the forest industry. Although the wood Toyotomi asked for could be found in relatively nearby areas from where he was, the fellers in Tokugawa period had to enter such deep mountains and reform of the transportation methods became the work which should be wrestled with (Totman, 1998). Consequently, Tokugawa gained use of lumber from more extensive regions, using it as he liked for maintaining the structures he built.

There is an evidence that excessive felling took place from a document of the Yamauchi clan, rulers of Tosa province in the Shikoku district. The Tokugawa Shogunate widely called for donation of wood in order to rehabilitate the capital territory which burnt up because of the Great Fire of Meireki in 1657. The answer from the Yamauchi clan was: “The mountains of our domain are exhausted; we have neither *sugi* nor *hinoki*. We are unable to provide good lumber as required by the shogun.” (Totman, 1998, pp.74-75) His complaint included some overstatements, because in the statistics of wood for tribute from Tosa to Osaka, the amount dropped down only around 1670 and remained in one tenth of that before.

Wood consumption notably augmented not only by the aristocracy but also by villagers because of the population pressure. Large forest lands changed into arable land, moreover from lands other than that, fertilizer, fuel, feed and wood for a personal use were picked up frequently. In the second half of the 17th century, most of the accessible biomass became a target of extraction by the overlap of demand from the sovereign and its subjects. As a result, production from forests at that time couldn’t catch up with the demand.

From the above, domestic forestry controls were created to obtain timber of all forests since 1660s after the development of "the early modern predation." Besides, since a large sum of primeval forests disappeared, struggles for wood use passed into a chronic state in many parts of the country. Also, the influence of lowering rivers reached a dangerous level and a lack of lumber spread around Japan with the general fall in the quality of the produced wood. In Japan, a lot of problems by massive logging started existing clearly through the feudal society where the mighty hierarchy reigned over the land.

3.3 The Beginning of Nationwide Logging and Passive Protection

After the 16th century, the number of documents that sounded the alarm on obvious wholesale deforestation increased. According to Radkau, literature on forests in the late 18th century were full of words used to express grief about how miserable forests had been weakened.

The people who were responsive to a wood crisis included farmers in mountainous districts. They rebelled against clear-cut logging management by official foresters, which was general at that time. For example, massive clear-cutting in Gailtal of the former German state of Carinthia brought a riot by farmers in 1838. They dreaded to suffer economic damage, particularly flooding caused by cutting all the trees. The riot was finally calmed down by support of an army, Radkau (2011) states.

At the very time from 1830s to 1840s, there were back-to-back heavy floods in the Alps and southern France. As a result, Swiss law of the day prohibited clear-cut logging. Some people in lowlands asserted that big floods occurred because illegal action was performed by farmers in mountain, yet almost all the opinions weren't accepted. That was because even the foresters who had been pushing forestry and vegetation reforms agreed that clear-cutting lead to the great floods.

Eventually in the 19th century, much solid criticism against excessive warnings also started being produced. On the other hand, the anxiety about wood deficiency was the power regulating wood supply in itself. The reason is that the action of logging was clearly visible even for ordinary people around villages and along roads. In short, the people who felt a sense of danger against deforestation abundantly restricted the consumption, preventing increase in demand of the market. That means the concerns of

people in those days about the future had been stabilizing wood supply more than the laws of supply and demand from a free market.

As above, the fear of wood shortage in Europe from the 16th to 18th century fulfilled the role of forbidding people to cut trees excessively. Consequently, clear-cut logging management forcibly promoted by a policy of rulers had changed into selective felling management. Radkau (2011) especially praises Switzerland for the prompt restoration of rights of selective logging management.

In Japan, forest product shortage became noticeable since deforestation by "the early modern predation" expanded in scope as well. The forest products mean a material of fertilizers, fuel, fodder and so on, which was required to run farms. Even worse, conflicts about a right to use forests broke out frequently as the social influence of wood shortage grew. As a result, it became the pressing need of the moment for Japanese people to search for new forest management in the 17th century, just like in Europe when it faced wood crisis.

According to research by Totman, the central core of the passive protection in Japan was to create a mechanism directly restricting forest use. Specifically, regulating who, for what, where, when, how many and for how much use, it enacted how the rules make people follow and also how criminals should be punished (Totman, 1998).

Moreover, what the shogunate and feudal domains worked on in order to settle disputes in various regions especially from 1640s to 1690s is to make sure a boundary line between their lands and villages. Rulers made an effort to strengthen the management system of woods, defining the places where valuable trees were by dispatching researchers. This tendency intensified when it was disclosed that the supply of national trees for feudal lords was limited after the Great Fire of Meireki in 1657. The researchers were sent all around Japan from Tsugaru Province to Tsushima Province by 1700, designating select mountain forest areas as "*ohayashi*," forests of the lord. They wrote it down in a drawing, and clearly separated them from nearby districts managed by the locals. Mountains put a ban on use were called "*tomeyama*," and "*tomegi*" reflecting it, which was a system of preserving trees, prohibited acts of endangerment to trees which had high economic value.

Although *tomeyama* and *tomegi* policy were the center of administration concerning forests by feudal lords, a large number of regulations were also created other

than that. As prevention of forest fires was particularly important, development and maintenance of fire-blocking zones, patrol system to prevent fires, village liability to fight fires and so on were noted, and there were also penal regulations against violation and negligence. In addition, it was controlled to steal useful woods for a government, dug up the roots and bring land into cultivation, log a grove and graze without permission. In lumbering, the rule has been laid down that only approved trees and districts could be gathered (Totman, 1998).

As suggested above, it is shown that passive protection system in Japan was an attempt to exert political control over almost all situations people associated with forests. The underlying aim was to keep up production of property which the regulation author thought would be desirable. As long as the objective was attained, mountain forests started to be saved as the significant "by-product."

From the comparison of forest history above, it is revealed that the policy which put "immediate gain" first lead to the exploitation of people both in Japan and Europe. Moreover, the exploitation was gradually extending to forests around Japan as rulers strengthened their hand, and economic activity expand in scale.

Generally speaking, the direct cause of why forestry in contemporary Japan declined is often said to be soaring domestic wood prices under the necessity of free trade. However, the reason why that result happened in the first place is because forests have been regarded just as the tool to increase people's authority and property. The domestic woods which were useful to promote the growth of wealth and power of Japanese people was inferior to those from other countries in the respect of "usefulness." That's why people lost interest in forests and forestry of Japan in an instant.

If Japanese people were really loving nature itself, and hoping to leave it to posterity, that conversion could not occur all along. The true reason why vast forest lands are left in contemporary Japan is because Japanese people have been neglecting the forests which is not "what should be loved" anymore. Japan has been keeping exploitative disposition historically as well as other countries. From considerations stated above, it can be guessed that the exploitative characters are produced by the spirits of selfishness taking no notice of other people and unborn generation, and encouraged by the massive economic system which enables people to gain what they

want in an unnecessarily large area.

4. Analysis

4.1 Forestry in Japan after the Modern Period

As mentioned above, also in Japan, obvious deforestation happened until the Edo period. Nevertheless, forests account for about 67% of the lands in Japan today, and needless to say, it's due to subsequent afforestation business. When the afforestation spread to the Japanese Archipelago is the latter part of 18th century.

After "the early modern predation," the demand of wood products still had been exceeding the supply. After that, intermittent planting work evolved into plantation forestry, the demand came to be fulfilled by an increase in the amount of favorable wood products. In addition, it became possible that farmers from rural areas entered the urban market and realized a profit. With these situations as a background, mountain owners were also very attracted to forestry management in business.

"The negative regimen" insisted upon by Totman promoted a suppression of the speed of deforestation, a restriction on cutting shrubs and acceleration of natural afforestation mainly from 1630 to 1720. As a result, they defended lands against the deterioration which finally would produce bald mountains around Japan, and moreover, succeeded in growing basic power of mountains which can assist healthy forests, Totman (1998) commends.

Meanwhile, natural afforestation wasn't enough to produce wood, fuels and fertilizers which Japanese people in 18th century demanded. Large timber became pretty rare, forest stands got sparse, and the struggles for rights to use forests continued as always. In this situation, because feudal lords and villagers took active measures to plant trees for keeping a large store of timber, artificial forests were seen all around the islands by the end of the century. As the forest areas increased rapidly in 19th century, by 1868 when Meiji period started, the broad area of artificial forests of Japanese cedar and cypress had been constructed in nearly all the lands from Kyushu District to Tohoku District.

Thus total demand of woods had gradually stabilized. Totman (1998) also states that people in the Edo period replaced the draft animals pulling hoes and carts before, and cavalry was no longer needed as wars were over, therefore the number of

horses and cows must have decreased. Consequently, the demand of wood products for fodder declined as well. In this way, it became easy to adopt a sustainable harvesting policy and conserve the terrestrial ecosystem, since the needs of Japanese people were satisfied by wood production in anthropocentric society as the total demand of woods stabilized or decreased.

The enthusiasm for planting reached its peak after the Pacific War. Japanese people, who faced noticeable deforestation due to the war, created coniferous forests one after another. Woodland scenery completely changed in 20 – 30 years because even natural forests in the interior and fuelwood forests in the village-vicinity mountain were switched to fast-growing conifers. However, the substitution of other materials for woods and the importation of foreign-grown timber began in earnest in this period. Thanks to that, domestic forests aren't logged so much anymore, on the contrary, even tree cleaning and thinning are no longer carried out because forestry has been looked upon as economically non-feasible.

Hence the unhealthy forests heavily crowded with trees spread to all parts of Japan now. From the study so far, the course of history can be observed that Japanese people had eventually forsaken the forests after exploiting them. Also in Japan after the modern period, selfish spirits are seen in the national character to the end.

4.2 Bioregionalism Superseding Profit Priority Principle

Bioregionalism is the idea to build a local circulating system, and make it sustainable by combining natural resources in the area with human resources such as culture, technique and talent. That's why bioregional economy creates "zero emission system" which can recycle energy in a region, minimizing the use of natural resources and keeping down environmental pollution and waste discharging as much as possible.

According to Michael Vincent McGinnis (1999), who edited the book of "Bioregionalism," the global economy continues to exploit the new market of Indonesia, India, Mexico and Brazil in order to increase production and consumption of the world. In the global alliance, new dependency also has been generated. In short, extremely enormous economic activity comes to be possible because advanced countries absorb plentiful resources out of developing countries. The use of local resources and the extinction of a species have been accelerating by entering the global market, and developed countries continue to grow by depending on it. "Vandana Shiva (1997)

argues that international trade agreements are forms of ‘biopiracy’ that protect the northern hemisphere from the southern hemisphere so large-scale economic production/consumption can continue,” McGinnis (1999, pp.68) mentions.

Industrial capitalism colonizes and makes uniform the regions spontaneously and culturally distinguished. A resource, or a place itself at times, would be changed into the item distributed among every nation. Bioregionalism insists that recovering place-sense is important in order to solve the problem. This “place” means the bioregion.

The bioregion isn’t a political subdivision such as municipalities and towns and villages, but the area which inherent culture has been originated from older times, decided out of regional features geographically and ecologically looked on. Many of the bioregions center the areas drained by a river and tributaries. They are geographical spaces unlike the neighboring areas which have a flora and a fauna particular to the region. Moreover, they are flexible and variable, influenced by natural appearances.

In addition, the importance of “reinhabitation” is underlined. That means people base on their bioregion, and live there with the consciousness of involvement with the place. For that, it is needed to connect humans with nature, and also a person with another person again as they have been severed historically. Therefore, it should occur that local people aware the natural environment around them and the relationship between human lives and the surroundings, and carefully learn about the features of their place (McGinnis, 1999).

On the other hand, there are a lot of similarities with the bioregionalism in *Satoyama* capitalism advocated by Kosuke Motani (2013). Motani points out in his book that economic growth of developed countries following globalization has been achieved by absorbing various things from non-competitive rural areas such as mountain and fishing villages, as McGinnis mentions likewise. Not being attended to the local climate and culture, rural people has been just exploited as economic centralization was progressing. It was efficient for economic growth that everywhere was homogenous, accordingly local unique characteristics were unnecessary (Motani, 2013).

Suggesting *Satoyama* capitalism, Motani emphasizes the restoration of rights for local areas. He recommends rural people to break away from “regions” as the

objects linked and drawn by big cities, and bring about completion of distribution in their community as much as possible. As what to be finished inside the region if at all possible, he mainly takes up energy as well as bioregionalists.

As an example, he holds up Maniwa City, Okayama Prefecture in Japan. Maniwa City was made by the union of nine surrounding towns and villages in 2005, and also it is one of the largest cities in Okayama Prefecture. However, the city is a typical mountain village area that the population is only 50 thousand, and 80% of the proportion is covered by mountain forests. One of the sawmillers there can provide almost 100% of electricity for managing his factory by biomass power generation. In other words, the vendor doesn't buy electricity from a power company at all. Besides, because it uses wood chips discharged at 40 thousand tons every year, its proceeds exceed expenditure in the end. The sawmiller also sells the woodchips, which will be still abundant after used as energy for the company, as the fuels called woody pellets. According to the company, it can generate almost the same amount of heat at a cost as low as that of kerosene. Sold for around 20 yen per kilogram, the pellets have been spreading in Maniwa City as boiler fuels for household heating devices and agricultural greenhouses.

As a result, it was revealed by a survey of the city that it can provide 11% of total energy consumed there by the wood energy. The proportion of natural energy is over ten times of that in Japan as a whole, which is only 1%. Also, the rate is smoothly increasing today. Motani admires the style of a region like Maniwa City, and recommends to use resources in a region well and reconsider the connection among neighbors.

As suggested above, bioregionalists deny immoderately enormous economic activities as also proved as a problem to be solved for forests of Japan in Previous Research. It can be considered that large-scale economic affairs are easily able to sacrifice local people and the natural environment from the fact that too-strong shogunates came to exploit even Tohoku Region had been filled by forests beyond their region in "the early modern predation" of Japan by Totman. Moreover, if it expands into faraway places over the sea, the sense of how many resources are consumed by each person becomes relatively dull. That's because it is clear by the study of forest history above that consumption spontaneously can be suppressed in the case people make up

their needs only in the region. In other words, the desire of people for things can be restricted by the sense of danger they are extracting excess materials.

Motani also warns of the economy of Japan relying on “money.” According to him, the existing convention that high quality of life follows economic growth can be destroyed soon as all things of nature will be taken as resources if all people continue to live with the chase for money necessary at the moment. Not to use extra money, labor and resources instead of just pursuing present profit will build a circulating society in the long run. Motani puts the accent on validity of *Satoyama* capitalism which can be seen to aware of bioregions from successful cases of some regions near woodland, including Maniwa City.

4.3 Self-felling Foresters in Contemporary Japan

There is a nonprofit organization which acts practically for forests and forestry in Japan with something resembling the bioregional thought indicated in the section 4.2. It is the NPO Jibatsugata Ringyo Suishin Kyokai (self-felling forester promotion association), which “realizes sustainable environment symbiotic forestry.” They insist that self-felling forestry is a sustainable forest management system, making both profitability and environmental preservation coexist at a high level. More specifically, it is the forestry management wherein one mountain forest owner deals with both gathering timber by felling and selling them at a market. Forestry in that way can be readily worked on, that’s why it will boost various kinds of people into the job for forests, they underscore. Therefore, their activity is also being paid attention to as “the key for revitalizing community.”

As the reason why self-felling forestry is sustainable, can be pointed out that the long-term management system never imposes a burden on either people or the environment. When starting forestry, the main burden for people would be the cost and labor. Actually, forestry in Japan has serious problems in those two points. However, in self-felling forestry, the merits are that initial and maintenance costs are much lower, and the style can create lots of workers because it adopts to both full-time and part-time workers.

According to the web site of Jibatsugata Ringyo Suishin Kyokai, the existing forestry supported by outsourcing clear-cutting in a short-term needs incredibly high

initial costs of about 100 million yen. Those for machine investment are needed just for a few employees. Moreover, it also costs about 10 million yen for refitting, and consumes 200 – 400 liters of fuel per day. This is the high-investment and high-cost type of forestry maintained from the Edo period until now. That's why national forests, prefectural forests, and private forests resulted in a large deficit of about 10 trillion yen in total. On the contrary, the self-felling selective forestry in the long-term costs only about 3 – 5 million yen for machines at the beginning. The local citizens can easily take part in it since all they have to do is to prepare only the bare essentials such as a chainsaw, a light truck and so on. Not costing for outsourcing, depreciation and fuels in excess, it can gain sufficient profits, unlike the existing forestry.

In respect of the number of workers and the amount of a labor burden per person, it is also difficult to sustainably manage the existing forestry. In Japan, the number of workers per unit area are really few, and it is less than 1/10 of that in central Europe like Australia and Germany. It is needed for mountain forest owners to have over a thousand hectares (for that 20 hectares of clear-cut times 50 years) of forest areas in order to earn profits every year in the case of the outsourcing operation segregating the "ownership" and "management" of mountain forests. This means that only the owners of a vast amount of mountain forests can continue forestry. On the other hand, in self-felling forestry, the workers can be sufficient for themselves if they have small or middle size of lands, 30 – 50 hectares per person for full-time workers, and 10 – 20 hectares per person for part-time workers. It can be considered that the number of workers per unit area will increase, and the amount of burden per person will decrease as the method is that they can earn income every year by staying at their land.

In addition, the most remarkable point of self-felling forestry is that it can build a long-term circulating society, keeping local areas including nature from "consuming" in excess. There is an example of this system in "Tosa no Mori Kyuentai," one of groups recommending self-felling forestry. According to *Kochi Newspaper* on May 17, 2016, Tosa no Mori Kyuentai is a non-profit organization promoting self-felling forestry mainly in Sakawa Town, Takaoka District of Kochi Prefecture, which first advocated this kind of forestry about 10 years ago. This organization places emphasis on forest revitalization by restructuring side-forestry, the promotion of using natural energy toward stopping global warming which only Kochi of "Forest Prefecture" can achieve

and the expansion of community business for elderly welfare utilizing local products from forest maintenance (Tosa no Mori Kyuentai, 2014).

Tosa no Mori Kyuentai also aims for the creation of a community which will be independent both financially and materially for the long run, making a system wherein people help each other inside their rural area while preserving the "nature" of the prefectural treasure. For that, they are trying to integrate welfare with environmental activities by beginning "firewood delivery business."

According to their official blog, many of the elderly people in hilly and mountainous areas have been leading their life using "firewood" until now. Nevertheless, it is becoming difficult to obtain it in daily life today, and that becomes a big problem. In short, it comes to be hard for the aged there to live out their lives in the place where they have lived long. And with that, in 2010, Tosa no Mori Kyuentai started to sell and deliver firewood gained by local self-felling forestry, for the local elderly. By this service, they are creating a circulating system of the community unit which local people cut local trees, and directly supply the energy needed in the area. Thanks to the selective forestry in the long term, forests can be logged in proper quantities, and bought and sold for a fair price without meditation fees. In other words, it is the bioregional system which doesn't consume extra resources and money.

Tosa no Mori Kyuentai proposed the self-felling forestry about ten years ago which can take care of forests sustainably, and Jibatsugata Ringyo Suishin Kyokai as a national organization is now widely notifying it to foresters and those concerned with municipalities. Creating the circulating system can suit local needs by community units although each person cannot make plenty of profits by self-felling forestry. The exponent of self-felling forestry thought of the way to serve both the local people and the natural environment for the long run. This small-scale economy by community units will play the role of suppressing resource exploitation, restraining the human desire which makes people take all they can do.

5. Conclusion

Today, issues relating to the destruction of nature are arising in all countries, needing to be readily dealt with. Even if the general policy is common in the world, the specific measures couldn't take stable effect unless they suit each country, as history

and values are rooted individually. That's why this study aimed at finding useful concrete measures for forest problems in contemporary Japan through historical analysis, strongly focusing on "forests in Japan." As a result, the realization of small-scale economic territories was raised as one of solutions.

At first, this thesis cast some doubt on the general recognition of a "Japanese eco-consciousness." There can be no grounds for the awareness the Japanese people are a group who has lived harmonizing with nature from older times unlike Western people, and the situation hasn't changed even now. This was the inference concerned from the reality that forests, typical parts of nature, have been mercilessly neglected in Japan. Therefore, in Chapter 3, the historical comparison of forests with the West was tried as it is often contrasted in order to make the guess more solid.

Compared from Ancient times to Early-modern times, Japan has surely traced a history close to that of Western countries, as suggested in advance. For example, as the forests of ancient Europe were controlled by rulers as the symbol of authority, those of counties near Kyoto were completely logged for architecture by the powerful people of the time. The wood shortage began to be seen as a problem in medieval Europe, while the forests in Japan after Early-modern times were also controlled nationally by the rulers of the country such as Toyotomi and Tokugawa, and came not to cover the demand at last. Nevertheless, Japan has never taken notably active measures even after that. Consequently, the mountains abundantly planted for "wood" after the war are left as they were at the present day.

From these considerations, two points below were inferred as the primordial cause which made trouble for forests in Japan. Firstly, there is the problem Japanese people have given priority to what they need "now" so far, leaving something "for the future" for later. This can be proven from the fact Japanese people have gained almost all the wood they wanted in the past from domestic areas, and afterwards, from overseas consistently since a long time ago. Secondly, the development of the excess large-scale economy can be also raised as a factor. In the cause, it has problems to foster the first point above. That is because the more control territory of authority and economic activity area spread out, the more resources were consumed both in Japan and the West.

As an attempt to cover the two factors above, this study gave an example of bioregionalism. It attempts to restrain wasteful production and consumption by

supplying necessities only inside a region as much as possible. As suggested above, data shows that the people who lived in the area where deforestation was clearly visible refrained from felling with consideration for the future. That's why bioregionalism has the merits that it inevitably makes local people think of something for "the future," and needless to say, promotes small-scale economic activities. Moreover, it can be regarded as a realistic solution to aim for because Japan actually has a lot of activity groups like Tosa no Mori Kyuentai.

In short, as a way to save forests in Japan, this thesis insists that "each local people should realize small-scale economic activity with bioregional actions" as Maniwa City introduced in Chapter 4. Japan can utilize trees for almost each region since its land has about 70% of forest areas. It is normally possible to produce biomass electricity, wood pellets for household use and even chopsticks broadly used in the country by wood waste or thinned wood from the domestic lumber industry. Clearly, it doesn't mean people who live in a region with no forests must not use wood products, but makes local people try as they can. In that special case, it should be also considered to obtain necessities from closer regions in order to prevent wasteful consumption of resources and money.

Further consideration for this study will be needed to yield any findings about the practical division of "regions" mentioned above, ways to break from the existing forestry and spread bioregionalism among the public and problems concerning the state economy. In the meantime, this thesis so far has been concluded that review of the local economy will be efficient to solve forest problems in Japan.

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