

Agricultural heritage systems of orchard based on the concept of *satoyama* and sufficiency economy: Green tourism perspectives for Japan and Thailand

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Abstract

This paper finds out the similarities and differences of the orchard systems underpinning the concepts of Japan's *satoyama* and Thailand's Sufficiency Economy Agriculture (SEA), to understand the distinctive features that correspond to the five criteria of the Globally Important Agricultural Heritage Systems (GIAHS) designation. Also, it presents green tourism perspectives in both the systems. In the study, a data analysis was conducted of the secondary resources and field surveys concerning the GIAHS Minabe-Tanabe Ume (Japanese apricot) system area of the Wakayama prefecture and the longan (*lamyai*) cultivation area in the Chom Cheang village of Chiang Mai Province. The similarities reveal five aspects of all criteria. Firstly, both systems have supported livelihoods and food security through the fruit industry and other diversified agricultural products. Secondly, they have given rise to high biodiversity that has been nurtured and maintained by forests, mixed orchards, and irrigation systems. Thirdly, the systems have adopted wisdom, knowledge, and technologies in developing the diverse genetic resources and nurturing excellent varieties of fruit. Fourthly, the orchards of both sites were dependent on the rice culture. Lastly, the remarkable landscape consisted of forests, orchards, sacred sites, mixed crops, and rice fields. As a result, the *lamyai* system based on the concept of SEA was acceptable with regard to all of the GIAHS criteria, when compared with the *ume* system based on the *satoyama* landscape. However, there were differences in using sources of wood for fuel, the irrigation systems, the methods of forest conservation, the *ume* and *lamyai* cuisines in the dietary culture, and the attractiveness of seasonal changes in orchard scenery. Green tourism espouses four perspectives for sustaining the GIAHS sites; these perspectives form a basis for guidelines for cooperation between Japan and Thailand. These guidelines concern promoting farm products for inbound tourists, conserving biodiversity, passing on the traditional techniques and agriculture, linking the sites of GIAHS with the UNESCO World Heritage program to increase tourism demand and accelerating the gentrification process in rural communities.

Keywords: Globally Important Agricultural Heritage Systems (GIAHS), green tourism, *satoyama*, sufficiency economy agriculture, orchard

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1. Introduction

The traditional farming system based on the concept of “*satoyama*” is an ideal model for Japan's agricultural landscape, which consists of a mosaic of woodlands, orchards, grasslands, rice paddies, and irrigation ponds or canals along with human settlements [1, 2, 3, 4]. *Satoyama* in Japanese means a homeland where nature and human lives coincide sustainably [4]. Although “*sato*” means village, and “*yama*” means mountain, it refers to the forest utilized by humans even on a flat land near the village when it is combined with the word “*sato*” [5]. In 1759, the term of *satoyama* was first described by a forester, Hyoemon Terauchi as the human-managed landscapes surrounding rural mountain woodland communities, and later the concept was reintroduced in the 1960s by

Tsunahide Shidei [1]. The system plays a major role as a hub of rich biological diversity [1, 3] which provides ecosystem services such as food and water, flood and disease control, recreational benefits, and soil formation [2]. In recent years, some agricultural landscape sites of *satoyama* have been honored as Globally Important Agricultural Heritage Systems (GIAHS) by the Food and Agriculture Organization of the United Nations (FAO); for example, Noto's *satoyama* and *satoumi* in Ishikawa prefecture and Minabe-Tanabe Ume system in Wakayama prefecture (out of eight sites designated in 2015).

In Thailand, the traditional farming has created an abundant ecosystem similar to Japanese's *satoyama*. The Thai word “*kaset porpeang*” translates to “Sufficiency Economy Agriculture (SEA)” in English.

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This agricultural system relies on “the new theory,” a set of principles of proper management of lands and water resources to benefit small-scale farmers underpinning the philosophy of sufficiency economy [6] proposed by H.M. King Bhumibol Adulyadej in 1993 [7]. The SEA allows farmers to become self-sufficient, self-reliant, and frugal in sustainable natural resources management in a three-stage process which is tied to the cultivation of diversified crops for consumption and production. At the first stage, the system aims to secure adequate food by optimizing farmland in the ratio 30%:30%:30%:10%. The first 30% is designated as a pond to store water and raise aquatic animals. The second 30% is rice paddies for self-consumption. The third 30% is set aside for growing fruits, perennial trees, vegetables, field crops, and herbs. The last 10% is retained for housing, animal husbandry, and other activities. The second stage includes pooling of efforts and resources by a group of farmers executing cooperative production and marketing. The third stage involves networking and coordination to establish the social capital [6, 7]. The concept of SEA also emphasizes promoting various forms of sustainable agricultural practices such as integrated farming, organic agriculture, and agroforestry. It requires farmers using their local wisdom and practices of traditional agriculture [8]; for example, utilizing livestock manure and human waste, creating the traditional irrigation system such as a ditch and dike landscape, and small reservoirs.

Focusing on the farming system of orchards based on the concept of Japan’s *satoyama* and Thailand’s sufficiency economy, both these systems have been the basis for the unique agricultural landscapes which provide valuable assets for green tourism. In Japan, the orchard landscape in the Minabe-Tanabe area of Wakayama prefecture has been designated as a Globally Important Agricultural Heritage System (GIAHS) because of Japan’s largest and oldest cultivation and production of “ume” or Japanese apricot (*Prunus mume*). In Thailand, various tropical fruits not only boost the country as “the kingdom of a hundred fruits,” but are also important exports which generate high revenue. For example, the total export value in 2006 was approximately 5.8 million baht, which was earned from five ranking fruits, namely durian, longan, lychee, mangosteen, and mango [9]. However, the agricultural landscape of Thai orchards has never been considered to be promoted as a GIAHS, as has been done with some Japanese orchards. One of Thailand’s largest orchard landscapes that should be taken into account is the agricultural

system of longan in Northern region, where 88 percent of the land is covered by plantation area, and 172,229 households have been established [10]. The largest longan cultivation areas are in the lowlands of Ping River Basin or the lower foothills along the valley in Chiang Mai and the Lamphun Province [11].

Longan (*Dimocarpus longan* L.) or so-called “lamyai” is the Thai word for one of the most important fruit trees for the domestic fresh market and export. The exportation of longan is mainly to China which controls the quality of products commonly known as Non-Tariff Measures or NTMs; for example, there are Good Agricultural Practices (GAP) codes, standards, and regulations [10]. As of July 2006, more than 85,648 longan farms had then registered for GAP, which comprises the majority of the certifications for all export fruits [12]. The registration of GAP emphasizes the concept of SEA to provide food safety and conserve the ecosystem. Furthermore, the cultivation of longan with rice, vegetable, orange, and other crops in organic farms, for example, by the organic agricultural farmer group of community enterprise in Chiang Mai Province [13], raises the importance of implementing SEA for risk management to address the instability of market pricing. Namely, farmers get income from three ways all year round; daily earning from all kind of vegetables, seasonal earning from harvests such as rice, beans, and aquatic animals, and yearly earnings from longan and other fruits [13]. As a result, the agricultural system of longan based on the implementation of SEA creates a distinctive landscape and value of agricultural heritage; this landscape should be advocated for registration as a GIAHS site for Thailand.

2. Conceptual framework of comparing the orchard systems based on *satoyama* and SEA for GIAHS designation and green tourism perspectives

GIAHS sites throughout the world are unique traditional agricultural systems linked to centers of diversity such as outstanding mountain rice terraces, traditional soil and water management systems, and specialized dryland systems [14]. However, not all of these distinctive systems can be termed as GIAHS [4]. FAO [15] defines GIAHS as “the remarkable land use systems and landscapes which are rich in globally significant biological diversity evolving from the co-adaptation of a community with its environment and its needs and aspirations for sustainable development” (p.1). The longan orchard system based on the concept of SEA implementation may fit this definition, but

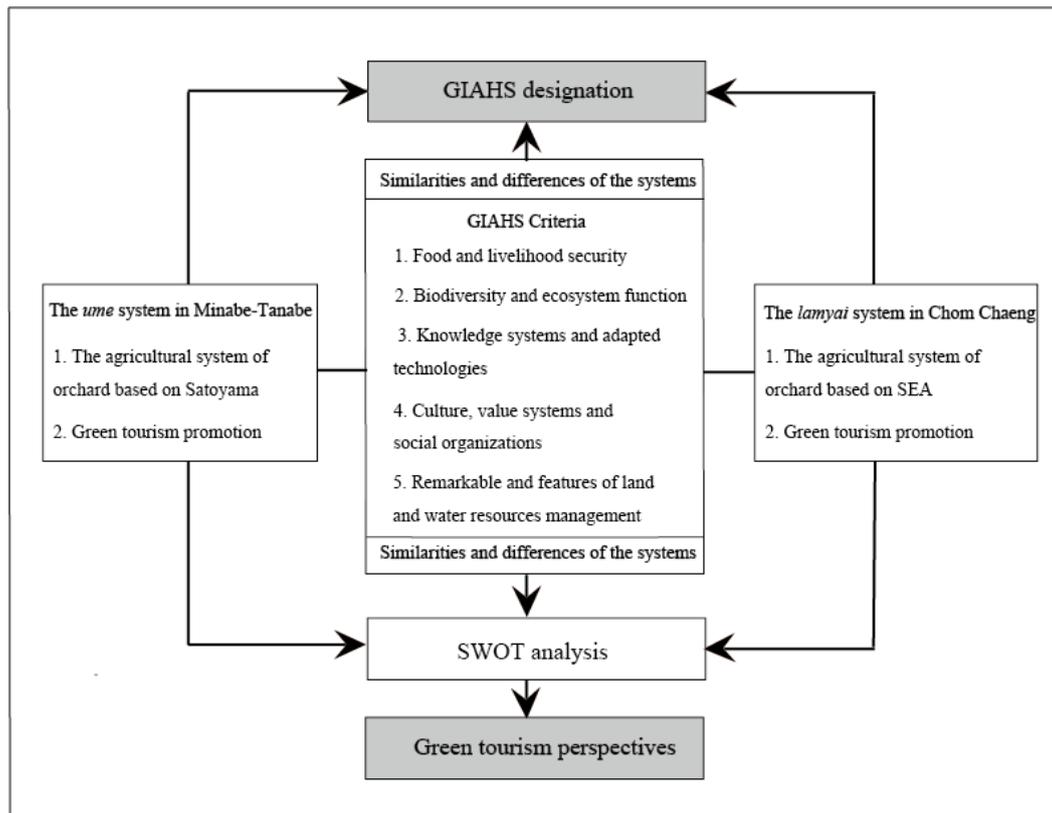


Figure 1 Conceptual framework for analyzing the GIAHS designation and green tourism perspectives

may not be in line with the five mandatory criteria. These criteria are, 1) food and livelihood security, 2) biodiversity and ecosystem function, 3) knowledge systems and adapted technologies such as breeding, farming, and irrigation, 4) culture, value systems and social organization that developed together with agriculture, and 5) remarkable landscapes, land and water resources management features [4]. As a consequence, understanding the qualifications and characteristics of the longan orchard system in line with the SEA concept is a preliminary study for considering a potential GIAHS.

In this study, the sampling site is the Chom Chaeng village where the longan orchards have been cultivated based on the SEA system in the southwest of Chiang Mai Basin. To clarify the possibility of the agricultural system in the site, a similar orchard system of GIAHS has been considered for this study. Thus, the Minabe-Tanabe Ume system in Wakayama is selected to examine the system and analyze its attributes with the main criteria of GIAHS, while comparing it to the longan system in Thailand's study site. Besides, the challenges to green tourism development due to a new designation in 2015 will be discussed (Figure 1). In Japan, green tourism is a form

of experiencing nature and rural life in the agricultural, mountain and fishing villages where Japanese culture has evolved [16]. Moreover, due to an aging society and depopulation in the rural areas [17], this form of tourism has played an important role as a key to establishing communication and cooperation between urban and rural communities in Japan since 1992 [16]. Green tourism and the orchard systems, therefore, should be reviewed with the SWOT (strengths, weaknesses, opportunities, threats) analysis to build local capacity to manage GIAHS, restructure rural community, and sustain the traditional agricultural practice in a strategic plan.

According to the conceptual framework, this research aims to find out the similarities and differences between the *lamyai* system—that underpins the implementation of SEA—and the *ume* system created by the concept of *satoyama*. The comparative study leads to an understanding of the distinctive features that support the systems prospects of being recognized as GIAHS. Also, green tourism perspectives in the GIAHS sites, for both Japan and Thailand regarding inbound tourism and exchange cooperation, have been presented in this paper.



Figure 2 Location of the study areas

Source: Based on the google map

3. Methods

The comparative study of orchard systems employed qualitative methods to collect data in both case studies in Japan and Thailand (Figure 2) between April and September 2016. They included document analysis; field observation; in-depth and informal interviews; and photographic analysis.

In the case of Japan, the Minabe-Tanabe Ume System area in Wakayama prefecture was examined to clarify the distinctive features supporting the successful application of a GIAHS site, and the existing green tourism promotion in the area. The data from secondary sources (i.e., books, online data, and other documents) and in-site inspections were analyzed. The in-site data were collected from the displayed information in the Minabe Town Ume Promotion Museum; the Umeboshi Kan, a factory for producing *ume* products and promoting green tourism in the Minabe-Tanabe area; an interview of a farm stay owner; and field observation in the cultivation area of the Minabe-Tanabe Ume system in Tanabe city.

In the case of Thailand, the sample site of longan cultivation area, in which the application of SEA in Chom Chaeng village, San Pa Tong District of Chiang Mai Province has been surveyed to compare the similarities and differences between the *lamyai* system and the *ume* system underpinning the concept of *satoyama*. The data from secondary sources (i.e.,

the village documents, and the research paper) and in-site inspection are analyzed based on the criteria of GIAHS, the in-site data derived from interviews of a village head and farmers who cultivated longan with the system of SEA, and field observation of the ecosystem and landscape related to the longan orchard.

4. Results and discussion

4.1 The *ume* system of *satoyama* and green tourism promotion in the Minabe-Tanabe Ume System area

The south-western part of the Kii peninsula in the Wakayama prefecture, is the location of Japan's largest Japanese apricot cultivation area, covering Minabe town and Tanabe city with an approximate area of 256.68 sq. km and a population of 79,563 (as of 2010) [17]. Topographic features comprise a *satoyama* type agricultural area with mountainous and rivers flowing through the valleys. In Japan, the Japanese apricot or *ume* has been consumed as an indispensable Japanese side dish, particularly in the traditional cuisine called *washoku* since it was introduced from China about 1,500 years ago. The cultivation of *ume* in the *satoyama* system can be described with respect to the concept of circulation that enables the sustainability of agriculture. The system of circulation starts at the summit of the mountain with the mixed coppice forests, which mainly consist of *ubame* (Japanese oak). The function

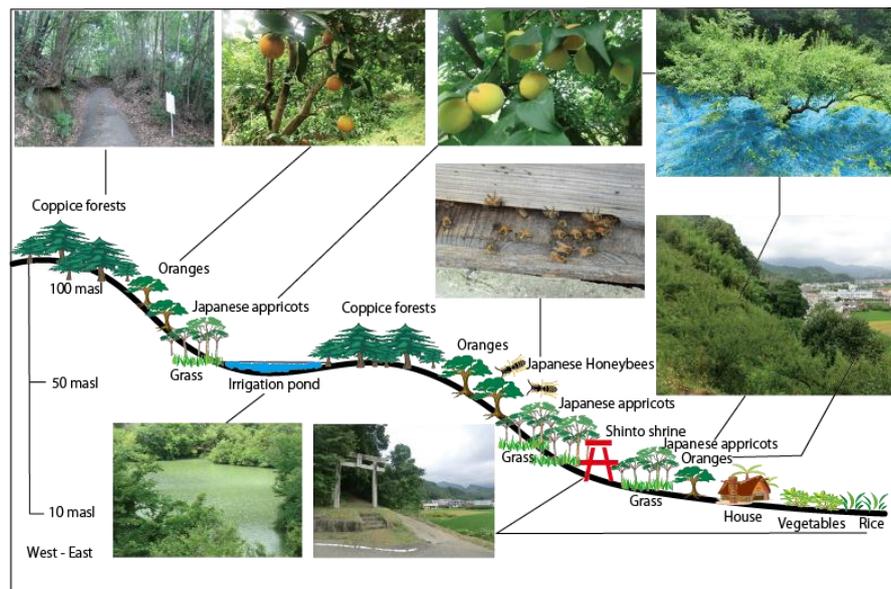


Figure 3 Agricultural transect of *ume* system based on the *satoyama* landscape

Source: Field observation by the author.

of coppice forests is to protect slopes from collapsing, fertilize the soil by conserving moisture, and keep the rain water absorbed for the orchards on the slopes underneath. Furthermore, coppice forests surrounding the orchards are used to make *kishubinshotan* charcoal and serve as habitats for Japanese honeybees that are essential for pollinating *ume* and other fruits. There are many kinds of fruit orchards on the slopes in addition to the *ume* orchards. The main fruit cultivated alongside the *ume* area is a variety of citrus fruits that can be harvested throughout the year. The slopes under coppice forest are well drained; so they are suitable for growing fruits, especially *ume*. Under the *ume* trees, grass has also been kept and grown to prevent drying and is used to make a natural fertilizer for *ume* cultivation. Before the end of the slope, the Shinto shrine called “jinja” stands as a spiritual center of the community where the deity (*kami*) offers the fruits of agricultural production. At the foot of the mountain slopes, the irrigation ponds are constructed to store water for growing crops from the slopes to the flatland where vegetables and rice are planted (Figure 3).

In the Minabe-Tanabe area, the landscape of *ume* cultivation is the unique characteristic of *satoyama* which not only maintains a regional ecosystem, but also generates diverse crops and *ume* products that meet the demands of Japanese cuisine such as *umeboshi* (salt-pickled *ume*), *umeshu* (*ume* liquor), *ume-rice*, *ume-noodle*, and *ume-stewed fish*. In recent years, approximately 3,000 people work in the food processing industry of *ume* production, and 70% of the workers are involved with *ume* culture [4]. In

promoting agricultural products generated from the agricultural system of *satoyama* in the Minabe-Tanabe *ume* cultivation area, groups of local residents managed their own cooperative to support and promote food products. Various tourism-related enterprises have been established including farmer markets, farm-based inns, and farmer restaurants.

The farmer markets can be seen as being managed both directly by JA (Japan Agricultural Cooperatives) and operated by a group of local farmers. A wide range of farm produce including *ume* products, fruits, vegetables, and flowers can attract approximately 500,000 customers a year [17]. The farm stay-based accommodations offer a variety of local *ume* cuisine and the urban-rural exchange green tourism programs; for example, picking the different kinds of citrus fruits during harvests. This kind of local inns operate under the project “nouka minpaku” (staying overnight with farmers), and are supported by the local government. In promoting the interaction between urban dwellers and rural people through green tourism, farmer restaurants or locally called “nouka resutoran” are good examples of local economic revitalization in Japan. One amenity found in this area is *Akizuno Garten*, located in Kamiakizu of Tanabe city. The gentrified wooden building from an old elementary school to serves the new functions of rural tourism and therefore makes this place unique and attractive. The services include a restaurant provided by local farmers with other optional uses such as lodgings, a kitchen for the cooking class, and study rooms for socializing. In addition, the visitor can also get first-

hand agricultural experience in *ume* processing or other farming activities.

In promoting green tourism in the GIAHS area, the governmental organizations, private sector, and local associations also provide tourists the information and tourism activities on cultivating and producing *ume*, including information on research contributions. The examples of government sectors include the “Ume Promotion Museum” in Minabe, which exhibits history, culture, techniques and other aspects related to *ume* cultivation; this museum receives about 35,000 visitors a year [17]; also, the “Minabe-Tanabe Reginal Association for GIAHS Promotion” in Tanabe promotes not only *ume* production, but also the charcoal-making industry, green tourism groups, researchers, and other entities to promote the maintenance of the *ume* system. The Umeboshi Kan represents an example of a private company in promoting green tourism by offering a free factory tour program to see *ume* manufacturing and purchase *ume* products. The Minabe Town Ume Cuisine Association, which is organized by women from farmer families, shows how capable local associations are in disseminating the traditional local dishes and newly created recipes using *ume* products, as well as expanding the exchange of cooking classes.

Besides the *ume* attractions, the related festival allures many visitors to soak up the atmosphere and the beautiful landscape of *ume* system. During the *ume* blossom season in February, the mountain slope is colored with sweet pink and becomes joyful with food stalls set-up in the orchards by the farmers. Furthermore, on the 6th of June, which is the “Ume Day”, the festival of offering *ume* to the local shrine, the Togan-jinja is made to show appreciation for the harvest. This ritual dates back to the the 16th century in the long history of *ume* sacrifice .

4.2 The *lamyai* system of the SEA and green tourism promotion in Chom Chaeng village

Approximately 29 km from the southwest of Chiang Mai city is the location of Chom Chaeng village. The village is situated on the Ping river basin and the foothills of Thanon Thong Chai mountain range, about 300 meters above sea level. The village area covers 3.13 sq.km with a total population of 462 persons. The longan cultivation based on the SEA system in Chom Chaeng village can be described based on the integrated farming that involves growing diversified crops and raising animals in the divided parts of the farmland which consists of an orchard, rice field, pond, and a residential area. In the orchard area, various edible plants have been cultivated

between the spaces of longan plots. Mostly grown are mixed vegetables and herbs such as eggplants, cucumbers, sweet corns, pumpkins, chilies, lemongrasses, galangals, basil, and yard long beans. Moreover, other kinds of fruits and perennial trees such as bananas, mangoes, and coconuts have also been grown alongside with longan trees. In the area of paddies connected to the *lamyai* orchard, besides growing rice in the wet season, the system of crop rotation has been practiced, namely, planting onion and rapeseed in the cool season, and cultivating soybeans to fertilize soils in the dry season. In addition, the orchard area or rice field has also been retained as a pond to store water in the dry season to raise aquatic animals. The area around the pond is used for growing not only mixed fruit trees and various herbs, but also for planting flowers to allure insects such as butterflies and bees for pollinating crops, especially longan. Besides managing the cultivation areas, the smallest part of the land kept for housing and husbandry is a crucial element in the concept of SEA. Establishing the rice mill and raising animals such as chickens and cows support farmers in earning additional income.

The agricultural system based on the philosophy of SEA involves not only the maintenance of natural resources in farmland to satisfy the highest profit but also directly ties in with forest conservation, which generates water and wood for cultivation. On the hills of Chom Chaeng village, the community forest or “pa chomchon” is well preserved and managed with rules for collective utilization by the villagers, and has been supported by the Airports of Thailand Public Company Limited (AOT). This organization cooperates with the villagers to build and maintain many small check-dams and irrigation ponds for storing water in the rainy season in so-called the system of “muang-fai.” Constructing the *muang-fai* for cultivation is the Lanna’s (a former kingdom in northern Thailand) traditional local wisdom in the agricultural practice from ancient times and is continued even now. The community forest covers the large protected area of small mountains. In this area, there are two sacred sites for protecting the ecosystem. One is the spirit shrine for respecting the “*phii khun nam*,” a deity (*phii*) guardian of the irrigation system (*khun nam*). Another is the relic-enshrining pagoda “*phra dhat*” of Chom Chaeng temple, a former ancient ruin of Vieng Mae (an old town of Lanna state) located as the community center for restoration of the forest and the irrigation system. From the temple to the top of the hill, which is about 400 meters high from the sea level, the indigenous deciduous forest is maintained

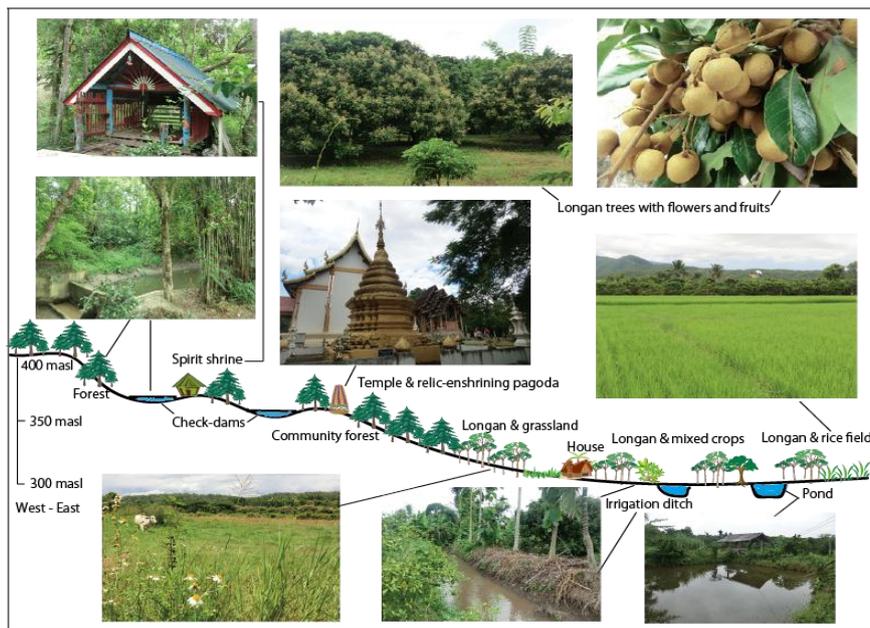


Figure 4 Agricultural transect of *lamyai* system based on the SEA landscape
Source: Field observation by the author.

by mixed trees including edible trees and timber. The edible forest acts as the source of seasonal food such as bamboo, mushroom, many varieties of rare medicinal plants, and wild fruits; forest animals are sources of food as well. The timber forest provides economic wood such as teak and agarwood. The area of *pa chomchon* connects to the *lamyai* orchard and grassland for cattle, the residential area for living and husbandry, and the arable land for the mixed crops cultivation and rice paddies which form the unique landscape of the SEA in the village (Figure 4).

Besides connecting the creation of the distinctive landscape, *lamyai* orchards also directly reduce overuse of wood for fuel. Namely, farmers cut the branches of longan tree after harvesting and use them for making charcoal for self-utilization and sale. This traditional practice relates to the concept of SEA in aiming to sustain the biodiversity and ecosystem function. Both *pa chomchon* and *lamyai* orchard have been created following the king's advice of "three forests, four benefits," meaning growing a mixed forest with three kinds of trees for fruit, for fuel, and for timber with the additional benefit of increasing humidity and soil retention. As a result, managing *lamyai* orchard based on the SEA can sustain not only the agricultural system but also the ecosystem of forest that generates mutual advantage for green tourism. For promoting longan production and tourism, the longan festival is held every year in August in the Lamphun Province.

Tourism in the Chom Chaeng Village was initiated in 2016, after the research project of green tourism development by a team of local residents had been started a few years earlier. The focus at the exploration stage of tourism development, therefore, involves gathering data and encouraging local participation to promote green spaces of agriculture and forest, clean food, and environmentally friendly tourism activities. The village sets a variety of learning activities. They include cycling and walking in the *lamyai* system area, experiencing farm work with locals, homestays, and cultural workshops such as longan cuisine cooking, woodcarving, wickerwork and drum making, and herbal sauna taking.

4.3 Similarities and differences of the two systems: A possibility of Thailand's GIAHS designation

The orchard system based on the satoyama in the Minabe-Tanabe Ume System area and the SEA in Chom Chaeng village are mosaic agricultural landscapes that form a variety of ecosystems from forests to orchards and paddy fields. As a result, they have the similarities and differences that can be discussed based on the five criteria of GIAHS (Table 1).

1) Food and livelihood security

The *ume* system and *lamyai* systems both support livelihoods through the fruit industry. In the Minabe-Tanabe Ume producing area, 70% of the working population engages in *ume* production or related industry including tourism. In the Chom

Table 1 Similarities and differences of the *ume* system and *lamyai* system

GIAHS criteria	Similarities	Differences
1. Food and livelihood security	- Fruit industry supports livelihoods - Diversified agricultural products	- Fuel production US: charcoal from coppice forests LS: charcoal/firewood from longan tree
2. Biodiversity and ecosystem function	- Biodiversity nourished by natural substances and maintained by forests, mixed orchards, and irrigation systems - Pollination mutualism between fruit trees and honeybee - Agricultural diversity	- Waterside environment US: irrigation ponds on mountains LS: traditional system of <i>muang-fai</i> , check-dams on mountain, irrigation ditches and ponds in the lowland
3. Knowledge systems and adapted technologies	- Diverse genetic resources and nurturing of excellent varieties - Technology of fruit cultivation and food procession	- Wisdom of forest management US: coppices forests LS: community forests
4. Culture, value systems and social organizations	- Fruit related festivals and events - Local bonds fostered by fruit industry	- Culinary culture US: rice- <i>ume</i> culture LS: no rice- <i>longan</i> culture
5. Remarkable and features of land and water resources management	- Landscape of forest, orchard, sacred sites, mixed crops, and rice field	- Seasonal changes in orchard scenery US: <i>ume</i> blossom attract visitors LS: <i>lamyai</i> blossom is less attractive

Remark: US = *Ume* System, LS = *Lamyai* System

Chaeng village, most households earn an income from selling longan to the fresh market and the processing company for export. Furthermore, the security of food and livelihood is derived from the diversified agricultural products from both systems. They include not only fruits but also rice, vegetables, herbs, and forest products. In addition, the *lamyai* system based on the SEA also provides aquatic and land animal products. However, fuel production is different in the two systems and varies with the sources of wood. Therefore, the charcoal in the *ume* system is produced from the various kinds of wood in coppice forests, but the charcoal and firewood in the *longan* system is made from the longan trees that help to reduce the overuse of woods from the community forest.

2) Biodiversity and ecosystem function

The *ume* system and *lamyai* system have a similarity in high biodiversity, attributable to the diversified crops cultivation and production nourished by natural fertilizers such as livestock manure and human waste, and maintained by forests, mixed orchards, and the irrigation systems. Pollination mutualism between fruit trees and honeybee can be found in both systems. The differences between the two are the irrigation systems. In the *ume* system, about 240 irrigation ponds have been constructed in the valleys surrounded by deep mountains and coppice forests that connect with the irrigation channels leading to the rivers and rice paddies [18]; but the *longan* orchards are dependent on the

traditional system of *muang-fai*. In Chom Chaeng village alone there are more than 400 check-dams built across the small waterways in the forest hills, to nourish the forest ecosystem and counteract erosion by reducing water flow in the rainy season and store water in the dry season. The network of check-dams links to the lowland irrigation systems to mitigate floods and cultivate diversified crops.

3) Knowledge systems and adapted technologies

Both orchard systems apply wisdom, knowledge, and technologies to develop diverse genetic resources and nurture excellent varieties of fruit. In the GIAHS *ume* system area, mainly 23 *ume* varieties are grown. Of these, “nanko” and “gojiro” are unique to this site [18]. In northern Thailand, there are more than 10 longan varieties growing in the area such as “edor” which is the most favorite one. In addition, farmers have their unique techniques of fruit cultivation such as tree pruning and honeybee pollination in both *ume* and *lamyai*, and transforming fruits into a variety of food products such as *umeboshi* or dried longan. However, the difference is in the focus on the local wisdom concerning forest management. The coppice forests are maintained by the “selective cutting” technique which secures a stable supply of wood to produce *kishubinshotan* charcoal; but the community forests in northern Thailand are protected by the Lanna belief of respecting *phi khunnam* and maintaining the *mung-fai* system, which includes binding the

Buddhist yellow robes to trees to make the forest sacred.

4) Cultures, value systems and social organizations

The agricultural system of the orchard in both sites are dependent on the cultivation of diverse crops; however, a paddy field is one of the main elements of farming. The agriculture related to the system, therefore, is dominantly centered on rice. In Japan, rice and *ume* are embedded in the Japanese dietary culture. The salt-picked *ume* or *umeboshi* has been served as an everyday side dish for 400 years due its medical efficacy in conditions such as food poisoning prevention and exhaustion recovery [4]. In addition, it can be used in producing traditional liquor called *umeshu*. In the modern days, *ume* and rice are used in a variety of food products such as *umesembei* (*ume-rice* cracker). On the other hand, in Thailand, rice and longan are cooked as a traditional dessert known as *khao niaw piak lamyai* (sticky rice with longan and coconut milk), and as a main dish served with steamed rice such as *muu tun lamyai* (braised pork longan). The menu from longan is not served as a side dish for every meal as *umeboshi* plays an important role in the Japanese diet. But the side dish for Thai meal is *namphrik* (chili paste), eaten with various kinds of fresh or steamed vegetables. Thus, longan is not a main part of the rice culture in the Thai diet.

5) Remarkable features of land and water resources management

The orchard systems of satoyama and SEA are based on similar components which feature the remarkable landscape of both systems, from the mountain slope to the lowland. They consist of a forest, an irrigation system, an orchard, sacred sites, mixed crops, and a rice field. However, the seasonal changes in orchard scenery offer different attractions to visitors. The *ume* blossom in February has a high potential to attract tourists because of its color; the pink color of *ume* flowers at this time can make a slope romantic. The *lamyai* blossom in rainy season is less attractive because the color of longan flowers is not very distinctive.

As this discussion has shown, however, the framework of green tourism development needs to incorporate internal and external factors to plan the tourism strategy. Effective strategic planning by local people should make it a priority to start with a SWOT (strengths, weaknesses, opportunities, threats) analysis to make sure the implementation is a success, not a failure. In both the agricultural systems, issues of strengths and weakness can be considered from the similarities and differences of the two agricultural

systems; meanwhile opportunities and threats are from tourism, policy, and current tourism development status of the areas, explained as follows:

- *Strengths* – both systems support fruit industry, provide diversified agricultural products, and sustain biodiversity and ecosystem based on local wisdom and sacred sites.

- *Weaknesses* – the *ume* system lacks combining GIAHS with the UNESCO World Heritage; the *lamyai* system lacks the distinctiveness of a culinary culture related to longan.

- *Opportunities* – promoting *lamyai* system as one of Thailand's GIAHS sites; taking the reputation of Chiang Mai and benefit from GIAHS brand to add value to the system; at the same time, the Minabe – Tanabe *ume* system can attract Thai tourists visiting the area.

- *Threats* – challenges because of competition from other sites of GIAHS.

In Thailand, although the FAO has not officially designated the site as GIAHS yet, the effort to practice sustainable agricultural with integrated traditional farming underpinning the SEA has been advocated throughout the country for nearly two decades. Certification of a site as meeting GIAHS requirements, such as the traditional sericulture community in Nong Sung District of Mukdahan Province proposed by the GIAHS National Committee, is based on the principle of development of Sufficiency Economy. As such, the importance of the agricultural heritage systems of Thailand ties in with the SEA; so does the system of longan orchard in northern Thailand. In the case of Chom Chaeng village in Chiang Mai Province, the SEA features of the *lamyai* system can be seen as corresponding with the five criteria of the GIAHS designation. The longan cultivation and production area in Chiang Mai Basin, therefore, should be considered for promotion as one of Thailand's GIAHS sites in the future. The GIAHS designation of the *lamyai* system based on the SEA does not only help in branding the longan products and promoting green tourism in the site, but also helps in preserving and emphasizing the importance of the Lanna small-scale traditional irrigation systems or *muang-fai*, which have been implemented independently by local communities for more than 700 years. This system is managed by the People's Irrigation Organization (PIO) which has established rules of integrity and a strong sense of justice in allocating water, along with the management of benefits distribution to the members [19] influenced by the law of King Mengrai, the founder of the Lanna state.

4.4 Green tourism perspectives in the GIAHS sites for Japan and Thailand

Being a GIAHS site does not directly safeguard the traditional agricultural system for the next generations, but it enhances the local communities by generating synergy domestically and internationally. Toward this notion, one of the main objectives of promoting the GIAHS is building the capacity to conserve and manage a GIAHS, generate income and add economic value to goods and services of such systems in a sustainable fashion [14]. In achieving this goal, green tourism plays an important role in sustaining the GIAHS sites and restructuring rural communities. As seen in the case of the Minabe-Tanabe *ume* system, green tourism offers great opportunities and challenges for sustainable development. As mentioned in our SWOT analysis, green tourism perspectives in the GIAHS sites for Japan and Thailand can be further explained in four aspects, as follows.

1) Promoting agricultural products

This aspect concerns disseminating information and the message to consumers by leveraging the GIAHS certification through activities such as a brand labelling, to allure more tourists into purchasing the products. This kind of promotion can also be found in Japan's other GIAHS sites. For instance, the Noto's *satoyama* and *satoumi* area in Ishikawa prefecture has launched a logo to popularize the GIAHS-related agricultural products that appears on the labels of 22 food items produced in the area [4]. This method ensures that the visitors recognize the importance of the heritage agricultural system that produces globally unique farming products, which also encourages the demand for local food and souvenirs from tourism. Toward this notion, Japan should create a tourism strategy to promote the products of GIAHS sites to Thai tourists; Thai tourists constitute the fifth largest group of Asian nationals traveling to Japan, with approximately 800,000 visitors in 2015 [20]. On the other hand, longan products should be promoted to Japanese tourists visiting Thailand, which will encourage the export of longan to Japan as a new market.

2) Conserving biodiversity and passing on the traditional techniques and agriculture

Green tourism supports environmentally friendly activities such as the *satoyama* nature walks to familiarize participants with the locality, offers eco-farmer workshops to reduce environmental impacts from chemical substances used in agriculture and school trips to learn *ume* tree pruning [21]. These activities constitute the efforts to sustain the quality of

rural landscape and biodiversity as ecologically sound farming that is essential for green tourism [22]. Agricultural learning activities, such as school trips to learn fruit tree pruning or managing the community forests, help to pass on the traditional techniques to new generations. Besides, by promoting working holidays and hands-on activities, tourist hosting is an interesting creative volunteer tourism, which facilitates a more sustainable approach to tourism with programs such as the Willing Workers on Organic Farms (WWOOF) [23]. In addition, green tourism plays a major role to conserve agriculture such as cooking a local fruit cuisine, learning techniques for food preservation, and offering food to the sacred site. These representative activities should be promoted domestically and internationally. Thus, marketing this campaign to Thai and Japanese tourists should target the repeat visitors and youth exchange programs.

3) Linking the sites of GIAHS with the UNESCO World Heritage to increase tourism demand

This idea proposes the strategy for managing tourism capacity in the UNESCO World Heritage Site (WHS) and coordinating tourism promotion with the GIAHS. In the case of the *ume* system in the Minabe-Tanabe area, green tourism will draw the attention of inbound tourists from the UNESCO WHS of "Sacred Sites and Pilgrimage Routes in the Kii Mountain Range." This site is currently well promoted to international visitors, particularly for western tourists [24] which offers a great opportunity for the Minabe-Tanabe GIAHS regarding green tourism promotion to this target group. For the case of *lamyai* system based on the SEA in Chiang Mai Basin, if it was designated as a GIAHS site, green tourism in the area could have attracted tourist from the urban areas and mitigated high tourist density in the ancient sites of Chiang Mai city, which has been registered in the initiative list of Thailand's prospective UNESCO WHS.

4) Accelerating the gentrification process in rural communities

In Japan, this premise is a change in the depopulation of younger generation resulting in the displacement of school buildings to serve a new function of green tourism. This situation lead to the closure of elementary and junior high schools [17]. *Akizuno Garten* in the Minabe-Tanabe Ume system, which has been gentrified from the primary school property to be a restaurant and lodgings run by farmers, is an example. Also, elsewhere in *Kobushi*, a reformed elementary school for tourist accommodation can be seen in Noto's *satoyama and Satoumi* [20]. Changing the functions of school buildings can be

assumed to be a form of gentrification process; George *et al.* [25] consider tourism to be a major contributor to this change. In Thailand, green tourism influences rural communities, particularly the community-based tourism (CBT) villages; for example, the redevelopment and modification of the traditional Thai house to be used as homestays for tourists. This trend to provide fashionable accommodation to allocentric tourists, who prefer learning the rural life, should be taken into account in Japan and Thailand to create green tourism lodges in the GIAHS sites.

5. Conclusions

The effort of this study contributed to the promotion of the longan system, based on the landscape and concept of sufficiency economy agriculture (SEA), to be designated as the GIAHS site of Thailand. The comparative study with the case study of the Minabe-Tanabe Ume system in the Wakayama prefecture, which underpins the concepts of Japan's *satoyama*, clarified and sharpened the characteristics and qualification of the orchard system of longan cultivation in the Chiang Mai Basin, based on the sample site in the Chom Chaeng village. Similarities and differences of the two orchard systems ensured that the system orchard of longan based on the SEA are in line with the five criteria of the Globally Important Agricultural Heritage Systems (GIAHS) designation. The advantages of GIAHS is not only a major focus to safeguard the abundance of biodiversity and values of traditional agricultural system, but also to generate benefits from the system in terms of economic revitalization by green tourism. As a consequence, green tourism in the GIAHS sites provides perspectives in sustaining the systems and rural communities, with guidelines for cooperation between locals and tourists; examples of such systems can be seen in the cases of Japan and Thailand.

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