

Planted Forest and Diverse Cultures in Ecological Village Planning: A Case Study in Tarama Island, Okinawa Prefecture, Japan

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Abstract Traditional village landscapes that were planned with a combination of local traditional beliefs and the Feng Shui concepts of ‘*ho:go*’, featured in remaining patches of flourishing planted forest on Ryukyu Islands, were estimated to have been built about 300 years ago. This study sought to clarify the actual landscape composition and map the layout and distribution of landscape elements, with a focus on understanding the dimension of the widespread Feng Shui woods. The cultural landscape combines shapes of patches of greening, corridors of planted forest belts and intersecting roads, scattered areas of water and clustered human settlements. On the relatively flat islands, a forest belt about 15 m wide was planted to curve in front of the village and be connected with the preserved natural forest on the low hills behind the settlements to shape a green protective circle with a radius of about 400 m. The grounds of each house were surrounded by one row of trees. Thousands of big Fukugi trees were found surrounding the settlements and sacred sites. These forest belts are almost completely connected and shape green corridors providing habitat for flora and fauna. Inside the village, roads have been designed to meander, and thus function to mitigate damage from strong winds. In Okinawa,

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utaki (sacred places dedicated to a guardian deity of hamlets) and the remains of old springs also consist of important landscape units. Such a traditional aesthetic village landscape embodies the harmony of man and nature, or ‘people living in the forests’. A cultural landscape with ecological context needs to be reevaluated as a rural planning style in island topography, and promoted as a tourist attraction in order to better conserve it.

Keywords Subtropical islands · Rural landscape structure · Harmony of man and nature · Planted forests · Green heritage · Eco-village

Introduction

The Feng Shui concepts have been used to guide city planning and village building during a long history in many areas in East Asia, in particular in China, Korea (Yoon 2006), Hong Kong and Taiwan. Feng Shui embodies an ancient philosophy of ‘the unity of man and nature’ and its associated design principles can provide useful guidelines for a sustainable landscape architecture (Chen and Wu 2009). Feng Shui contributes to the cultural landscape in cities, towns and villages (Choi 1991; Whang 1991, as cited in Hong et al. 2007), as well as eco-village planning principles with theoretical completeness in terms of aspect and topographical shape (Whang and Lee 2006).

Forests inside traditional villages have attracted considerable interest owing to the ecological functions of protecting villages and croplands from strong winds, mitigating floods, reducing non-point source pollution, and providing and connecting various wildlife habitats (Lee 2003; Lee et al. 2007 as cited in Koh et al. 2010). Koh et al. (2010) reported that *Bib* woods, which are a unique type of traditional Korean village grove, reduced the wind speed of mountain valley breezes by 30 %.

In traditional Ryukyu Island villages, planted groves and forest belts are widespread. Forest belts of *ho:go*, which literally means ‘embracing protection’ and usefully refers to a configuration of ideal Feng Shui landscape, were designed and planted about 300 years ago. Forest belts were planted to surround whole villages or several neighbouring villages and are also called village *ho:go*. Such forest belts were cultivated in the early part of the seventeenth century by all households in the village under common management, and cutting was prohibited. Among these preserved forests, native tree species also regenerated inside the woods alongside the planted species of Fukugi (*Garcinia subelliptica*) tree, and a rich biodiversity of herbaceous vegetation could be found (Chen et al. 2008a). These woodlands were converted to protective forests or communal land during the Meiji Period (1868–1912). Unfortunately, the majority of the forests were destroyed through conversion to roads, residential areas or cropland during the rapid urbanization and rural development after WWII.

Among the research on traditional villages in Okinawa, there exist classical early works of cultural geography (e.g. Nakamatsu 1977), comprehensive research on architecture (e.g. Sakamoto 1989), and some recent works on the forest belt planted surrounding the houses (Chen et al. 2008b; Anto et al. 2010). Previous studies also

mention the conceptual context of a Feng Shui village landscape (Yoon 2006; Chen et al. 2008a). However, a comprehensive understanding of traditional village landscape units in Okinawa from the perspective of an ecological landscape is still lacking. Reflecting upon 25 years of landscape ecology, Antrop (2007) concluded that societal issues were little studied.

This study examines the features of the traditional village landscape in small island topography in Ryukyu Islands. The actual landscape composition of the island village landscape is explored within a cultural context and with reference to the local climate and topography. The village is viewed as a holistic landscape with a focus on the distribution of the remaining trees. A further objective of the study is to examine the dimensions of the forest belts surrounding the village due to their significant ecological functions on the island, and to prove further the previous hypothesis that such a village landscape was formed in the first half of the seventeenth century.

Research Method and Survey Site

The Ryukyu Kingdom was an independent kingdom which ruled most of the Ryukyu Islands from the fifteenth century to the nineteenth century. The Ryukyu Kingdom was a Chinese tributary state during much of its existence, and therefore had a much closer relationship with China than with Japan. The Ryukyu Kingdom lost its independence when the Satsuma armies invaded the islands in 1609. Under the double tributary system after 1609, it was an urgent issue to improve crop growing and timber production. Feng Shui was used as a tool by the royal government to enhance agricultural production. After the end of the nineteenth century, Japanese culture entered Okinawa and the Ryukyuan culture weakened in many ways.

Tarama Island (Fig. 1) was selected to conduct a field survey because Tarama has the only remaining village *ho:go* in Okinawa Prefecture, which is recorded as being planted in about 1742 (Nakama 2003). Being an isolated island about 345 km from Naha in mainland Okinawa, the island was not acquired by US troops during WWII. Trees have been well preserved compared to other islands in Okinawa Prefecture (Anto et al. 2010).

Tarama Island is located at lat. 24°39' North and long. 124°42' East, about 67 km west of Miyako Island and 35 km northeast of Ishigaki Island. The Miyako and Ishigaki Islands are part of the Sakishima chain in the southernmost part of the Japanese Archipelago. Tarama Village includes Tarama Island as well as Minna Island, located about 12 km to the northwest. Only Tarama Island was included in this study because there is no settlement remaining in Minna Island. The total area of Tarama Village is 21.9 km².

Village houses are clustered in the northern part of the island, close to the foot of a low hill (see the Supplementary Materials Figure s-1). Large areas of flat agricultural land sprawl outside the village. A stretch of forest belt has been planted between the settlements with the farmland.



Fig. 1 Aerial photo of Tarama Island

According to the survey data by Okinawa Prefecture, the vegetation in Tarama Island can be classified into four major types: the coastal forest that consists of *adan* (*Pandanus odoratissimus*) and *mokumaou* (*Casuarina equisetifolia*); cultivated crops in the spacious land in the middle of the island; planted Fukugi groves that were designated as a specific plant community and natural treasure by Tarama Village; and the broadleaf evergreen forest in the mountain forest in the north.

During the Ryukyuan Period, the current Tarama Village had three hamlets, these being Nakasuji and Shiokawa on Tarama Island and Minna on Minna Island. Only one family now lives on Minna Island, raising cattle. Minna *utaki* is still covered with flourishing forests. *Utaki* is a native religion existing prior to the then Ryukyu Kingdom and was always marked by a spiritual nature, but without any buildings for worship. Huge Fukugi trees surrounding it were also measured because it was part of Tarama Village in the past. The other two hamlets of Nakasuji and Shiokawa are located at the foot of the hill on the north of the island, only separated by a road extending from south to north. The two hamlets can be treated as one holistic landscape from a cultural or topographical viewpoint (Chen et al. 2008a). Thus, the village landscape of two hamlets is considered as one landscape in this study.

A 1:10,000 topographical map issued by Tarama Village Office was used as a base to map the landscape units of mountain, planted forest belts, village houses, old springs, and village roads. HO CAD software has been used to draw the distribution of landscape units. The mountain forest and planted forest belt were drawn on the topographical map with reference to present land use. The location of springs that were used for irrigation and drinking water, but abandoned after switching to the use of tap water, have been mapped according to the village history that was published by the Village Office of Tarama (1973).

Among all the landscape units, green space was examined for its functions of a natural habitat and as a resource for flora, fauna and human settlement. In the villages of the Ryukyu Islands, an overwhelming majority of the landscaping trees are Fukugi trees. Fukugi trees. Fukugi, ‘福木’, literally means ‘happiness’ tree in Japanese. The same Chinese characters of ‘福木’ are used in Taiwan and southern China.

All the old Fukugi trees with a diameter (DBH) greater than 25 cm were recorded. It would be possible to take cores and obtain precise estimates of tree age but this was not done because of scarce funds and the complex process to obtain a permit to take cores from old trees. Therefore, the estimated tree age was calculated using the formula $[\text{Age (year)} = \text{DBH (cm)} / 2 \times 8]$ that was developed by Hirata (2006). Based on this formula, a tree with a DBH of about 25 cm was estimated to be 100 years old, thus it can be estimated that it was planted during the Ryukyu Kingdom period. All remaining old Fukugi trees on Tarama Island were surveyed, including those around the village houses, the sacred sites, and even inside the village *ho:go*, which is a forest belt planted in front of the village for Feng Shui purposes. The heights of a sample of one in 20 trees were measured, as well as a few near each house. The highest trees in each house and around each *utaki* were also measured in order to estimate the growth rate of Fukugi trees in a managed forest.

Concerning the approximation of estimated tree age due to the discrepancy of geographical location and competition from other trees, all surveyed Fukugi trees that were planted around the houses were further categorized by age (≥ 250 ; 200–250; 150–199; 100–149 years). A topographical map was used to present the distribution of Fukugi trees older than 100 years. The four age groups of the surveyed trees were mapped by house and presented in four distinct colours. Landscape units of mountains, settlements, forests, roads and springs were mapped with software of HO CAD.

In order to visually demonstrate the distribution and the location of the remaining tree belts in the village, the layout of the tree lines were recorded at the field and reproduced on the base map.

Results

Landscape Elements and Geophysical Attributes

On Tarama Island, forested mountain—called *kusatimui* in local language—is located at the back of the village. Several sacred sites of *utaki* and ancient graves are situated inside the forest. Forest preservation results in rich biodiversity of natural tree species. Farm land divided into square plots by Fukugi tree lines can be seen on the middle of the hill (see Supplementary Materials, Figure s-1).

A total of 63 big Fukugi trees were measured and the biggest one in terms of DBH was estimated to be about 235 years old. Among the three house remains with Fukugi trees, four Fukugi trees were older than 200 years.

It is not clear when Tarama Village moved to its current location. Being a typical village built in pre-modern Ryukyu, all village houses are clustered together; Fukugi tree belts were planted and coral reef stone fences were built as windbreaks and for property distinction (Fig. 2). Soon after WWII, however, local people broke the coral reef stone fence into small pieces and used them to mix with cement to build houses.



Fig. 2 The only remaining house with traditional coral reef stone fence in Tarama Island

Meandering Village Roads

A traditional Ryukyu village appears to be in good order when viewed from the sky or from a map. However, it is difficult to see to a distance of more than 30 m when walking inside the village. Looking at the network of village roads, it was found that no roads are straight or intersect at right angles. All roads have been classified into roads running from north to south, and roads running from east to west. The extent to which north–south roads deviate from due north and east–west roads deviate from due east was measured in degrees, with HO CAD software on a 1:10,000 topographical map issued by Tarama Village Office.

Twelve vertical roads and 17 horizontal roads were marked in Tarama Island (See Fig. 4). The extent of road deviation is shown in Table s-1 at the part of the Supplementary Materials. The north–south roads are marked with the A to L, and the east–west roads are numbered 1–17. The meandering roads were planned to mitigate the strong winds. It was found that the degree of deviation of vertical and horizontal roads differed for each crossing. Figure 3 (also see the Supplementary Materials Table s-1) suggests that most of the vertical roads deviate about 20°–40° from the magnetic north to northeast, and the horizontal roads mostly deviate from 20° to 50° from east to southeast.

Sacred sites are important cultural landscape units in Okinawa. *Utaki* was the local religion existing even prior to the then Ryukyu Kingdom and long before Feng Shui was introduced to Okinawa in the fourteenth century and applied as national policy in the eighteenth century. Thus, local religion played a vital role in the landscape composition arrangement in Okinawa. Fukugi trees were found in most of the sacred sites in the Tarama Islands. A total number of 683 Fukugi trees were measured in 11 sacred sites, among which 9 are located inside or near the village or located on the periphery of Tarama Island (see Fig. 4), and one in Minna Island (Table 1). Shiohawa *utaki* (Fig. 5) had the largest number of Fukugi trees at 342, and

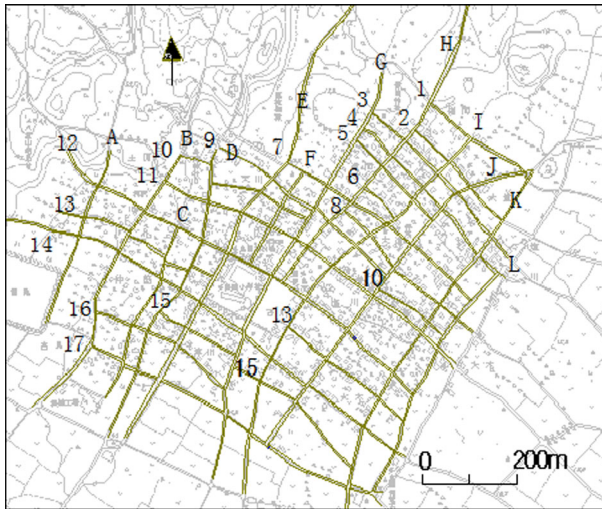


Fig. 3 Village roads inside two vicinal hamlets of Tarama Village

Futenma *utaki* and Pitumata *ugam* had the fewest Fukugi trees, at 2 and 3, respectively. An approach 650 m long lined with Fukugi trees leads to Shiokawa *utaki*. A total of 222 Fukugi trees were counted along the approach, among which 16 trees are more than 200 years old. The large number of Fukugi trees planted surrounding Shiokawa *utaki* (Fig. 5) is attributed to its location in the flat agricultural land about 850 m from the periphery of the hamlet, as well as its being the most important sacred site in Shiokawa hamlet.

In the southern part of the mainland and many small islands, the typical geology of Ryukyu limestone contributes to a lack of rivers or brooks. Most of the springs are located inside or along the periphery of the village (Fig. 5). These old springs became the sacred sites where local people prayed. It is supposed that the earliest people lived around these spring waters before the current clustered settlements. These spring waters had been the most important water for people's life and irrigation until the 1960s.

The Role of Trees in Landscaping

Groves and forest belts could be considered as one of the most important parts of village landscape, in Tarama Island in particular. It was estimated that Tarama has more than 15,000 Fukugi trees. A total of about 3,800 big Fukugi trees (Tables 1 and 2), with DBH greater than 25 cm, were measured on Tarama Island, including trees around houses and sacred sites and trees originally planted in village *ho:go*. The mean tree height of surveyed Fukugi trees ranges from 7.5 to 15.5 m. The total numbers of remaining large Fukugi trees around houses were found to be 1,592 and 1,089 trees in Nakasuji and Shiokawa, respectively (Table 2).

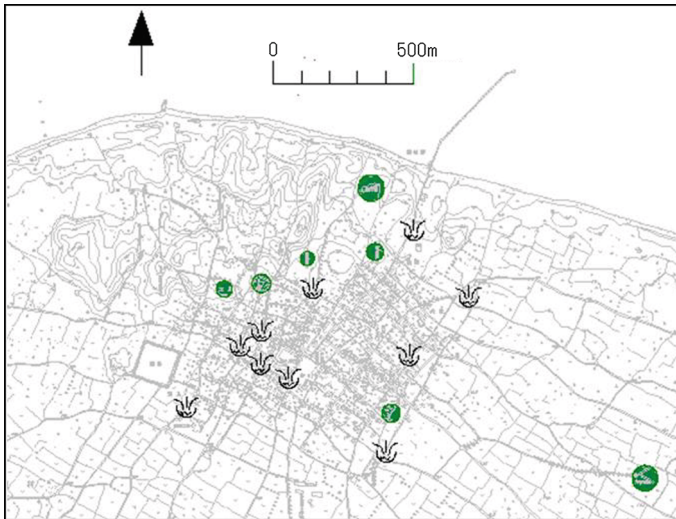


Fig. 4 ● Sacred sites with planted Fukugi trees. ☞ Old springs that were used as irrigation water and drinking water. Locations of sacred sites and spring waters inside or near the current village

Table 1 Fukugi trees in sacred sites

<i>Utaki</i> and other sacred sites	Total tree number	Tree height (m)	DBH (cm)		Estimated tree age (years)	
			Mean	Maximum	Mean	Maximum
Tarama Shrine	55	13.5	33	47.5	132	190
Ungusuku <i>utaki</i> ^a	75	11.3	36.7	68	146.8	272
Tomari <i>utaki</i>	64	11.5	30.7	53	122.8	212
Minema <i>utaki</i>	15	10.2	35.6	66.5	142.4	266
Ubu No Ie	11	7.7	37.7	67	150.8	268
Futenma <i>utaki</i>	2	12.6	31	30.4	124	121.6
Pitumata <i>ugam</i> ^b	3	10.1	65	57	260	228
Terayama <i>ugam</i>	55	12.1	62.5	33.3	250	133.2
Mtabaru <i>ugam</i>	37	15.5	53.2	35.7	212.8	142.8
Shiogawa <i>utaki</i>	342	9.5	35	77.7	140	310.8
Minna <i>utaki</i>	24	7.5	37.5	58.9	150	235.6
Total	683	10.2	34.8	77.7	139.2	310.8

^a Both *utaki* and *ugam* refer to a sacred place dedicated to a guardian deity of a hamlet in Okinawa

^b *Ugam* is a general term for a sacred site in Okinawa

The biggest Fukugi tree in Shiokawa *utaki* was estimated to be about 311 years old. The biggest two trees inside the village *ho:go* were estimated to be 297 and 246 years old. The biggest tree among the two lines of the front approach to Shiokawa *utaki* was estimated to be about 269 years old. The biggest trees found in



Fig. 5 a Shiokawa *utaki* with a 400 m long road lined with Fukugi trees. b Path leading to the *utaki*, located among the farming land, one of the origins of early settlement

the *utakis* of Ungusuku, Tomari *utaki* and Minema were about 260 years old (Table 1). The biggest Fukugi trees in house gardens in Shiokawa and Nakasuji were estimated to be about 257 and 262 years old, respectively.

The distribution of the biggest trees for each survey house is shown in Figure s-2 of the Supplementary Materials. About half of the houses had Fukugi trees older than 100 years, but few houses in the east and south had big Fukugi trees in terms of volume. Fukugi trees more than 200 years old were found to be spread all over the settlements. There were more trees more than 200 years old in Nakasuji than in Shiokawa (see Supplementary Materials Figure s-2). It is said that Nakasuji was inhabited earlier than Shiokawa, which is why more big Fukugi trees are found in this district. In general, Fukugi trees in the northern and western parts of the village were measured to be bigger than those in the southern and eastern parts. Fukugi trees seem to have remained in abandoned house grounds which are mostly used currently as farm land. The remaining Fukugi tree lines were drawn based on the village map (Fig. 6). It is found that the tree lines in the south of the garden, in particular those facing roads, no longer exist in many cases.

Dimensions of Village *ho:go*

Dimensions of planted belts were measured based on the old aerial photos that were put into HOCAD software. A forest belt of village *ho:go* about 1,800 m long and 13 m wide was planted to circle along the front of the village and to be connected with the forested mountain at the back to shape a greening circle with a radius of about 400 m. About 80 % of the upper storey stand trees are Fukugi trees, followed by *Calophyllum inophyllum*. There were more than 40 species found in the understorey.

There are another two village *ho:gos* (described in Supplementary Materials Figure s-3) which could be identified from the aerial photo taken in 1945, but which do not exist at present. Such a forest belt of village *ho:go* was measured to be about 13 m wide and to have a length ranging from 2 to 4 km depending on the numbers of the hamlets. It is judged from the photos that both forest belts were of planted pine

Table 2 Number of remaining Fukugi trees in Tarama Island, compared to other previous survey sites

Hamlet	Number of remnant Fukugi trees					Estimated age of biggest tree	Mean tree height (cm)	Max tree height (cm)	Survey house numbers
	Total	≥300 years	200–249 years	150–199 years	100–149 years				
Okinawa Island									
Bise	1,075	1	17	89	360	609	300	994 ^a	99
Imadomari	964	0	2	9	111	842	268	842 ^a	155
Tonaki Island	1,293	0	15	85	307	886	294	900	165
Aguni Island									
East and West	2,561	0	16	82	486	1,977	296	723	333
Hama	500	0	3	6	55	436	281	713	85
Tarama Island									
Shiogawa	1,089	0	1	8	157	923	257	1,010	124
Nakasuji	1,592	0	1	17	240	1,334	262	1,030	160
village <i>ho:go</i>	458	0	1	14	107	336	297	1,031	1,170

Tree heights in Bise and Tonaki were counted based on the survey data from 2005 to 2008



Fig. 6 Distribution of Fukugi tree lines surrounding the houses

trees. The two vicinal hamlets of Hirae and Maezato (top photo of Supplementary Material, Figure s-3) were surrounded by the nearly circular forest belt with a diameter about 1,200 m. The semi-circle of forest belt that was about 3,500 m long (see Supplementary Material Figure s-3) was located on the gentle slope to the north of the four villages of Tonoshiro, Ookawa, Ishigaki and Aragawa.

Discussion

Adaptation of Landscape to Local Climate

The planned village landscape in the Ryukyu Islands consists of clustered houses encapsulated by planted forest belts (see Figs. 2 and 6). Intersecting roads divide the whole village into many small groups of houses which are demarcated by tree lines and further closely embraced by forest woods. Forest belts were planted as a dividing wall in the outer ring between the settlements and farming land. Such a close surrounding contributed to the local climate being vulnerable to natural disasters of strong winter winds from the north and destructive sea water brought with typhoons from the southeast from July to September. In contrast to the Ryukyu Islands, Feng Shui villages have been established for protection against floods in plains in Korea, and from landslides in the mountainous areas in China. Combined with case studies in China, Korea and Okinawa, it can be concluded that Feng Shui

villages were set up for the mitigation of disasters of water, winds and landslides to some extent.

Inclusion of the local religion was another important feature of the landscape layout. Feng Shui was spread throughout the islands in the early 1700s, and could be considered as a part of the Royal policies. Local religion was integrated to lay out an ideal landscape.

Orientation of Village Roads

Feng Shui classic books in China and Okinawa mention the winding roads as one of the landscape amenities. Another case study in Tonaki Island also reported that winding roads were planned to channel and reduce the damage of strong winds in both summer and winter (Musha et al. 1988). North–south roads had deviations varying from 4° to 32° of declination angles off due east. East–west running roads vary from 2° to 30° of declination angles from east (Musha et al. 1988).

The theoretical support of winding roads exists in *Hokubokusan* Feng Shui Diary. It is a brief record of Feng Shui inspection and suggestions for 47 villages in the Yaeyama Islands in the south of Okinawa Prefecture by a Feng Shui master named Tei Ryosa (Chinese pronunciation Zheng Liangzuo) from 1863 to 1864. Village roads were considered to be the third priority, following the compass direction of the village and tree planting (Tsubaki et al. 2003). The Feng Shui diary commented on the location and shape of about 23 villages. A winding road was judged to have an auspicious shape. The application of the meandering principle to road networks was promoted on Ryukyu Islands. It was one countermeasure to mitigate the damage from strong winds.

Connected Forest (Green Belt) Corridors

Sacred sites are covered with thick forests or a grove of planted trees. In Okinawa, Fukugi trees account for an overwhelming majority of the trees planted around the sacred sites. Thousands of big Fukugi trees were found inside and surrounding the villages in Tarama.

Fukugi trees around the houses and of village *ho:go* can be treated as the green corridors inside the village landscape. Fukugi trees planted around the sacred sites are the groves distributed inside or near the village. These forest belts were almost completely connected and shaped green corridors providing a habitat for flora and fauna. These trees grow about 10 m high with higher branches crossing together like a green ‘tunnel.’ Such a green landscape is also one for ‘people living inside the forest.’ Sacred groves and ritual sites represent a potential contribution to conservation of biodiversity especially in fragmented landscapes (Mgumia and Oba 2003).

The Shaping of the Fukugi Tree Landscape on Tarama Island

Because historical records related to the establishment of traditional village landscapes are scarce, it was hoped these could be inferred from the surveyed old

trees and limited local historical records. It is recorded that village *ho:go* was first planted in 1742. Shirakawa Uji Keitsu: (白川氏惠通), who was the head of Hirara Town, Miyako District, was commanded to plant village *ho:go* in Tarama Island in 1742 (Nakama 2003).

According to the Village Chronicles of Tarama Island (1973), three *utakis* of Ungusuku, Tomari and Shiokawa were set up in 1753. Thus, it can be supposed that the recorded establishment date of Shiokawa *Utaki* might refer to the time when a cottage was built and Fukugi trees were planted. It can be inferred that planted trees around the sacred sites was considered to be an important part of village landscape.

The largest trees on Tarama Island were found to be about 270 years old and surrounded houses and even sacred sites, except for one tree of around 310 years old in Shiokawa *utaki*. From the remaining huge trees, it can be inferred that Fukugi trees around the houses were planted at a similar time to the forest belt of Fukugi trees of the village *ho:go*. It is likely that the planting of the 1,800 m forest belt took several years. It can be assumed that Fukugi trees were planted during about one decade in the mid 1700s.

Comparing the biggest Fukugi trees found in village *ho:go*, sacred sites and surrounding the houses, it could be concluded that a systematic planning of such Feng Shui villages might have been completed during the middle of the 1700s. Before occupying the current village location, people lived inside the forests on the hill. With the population increase and strengthened institutional control, people moved down to the flat land and built the clustered houses. Planted windbreaks were a functional choice. Such a great forestation project was realized for its theoretic framework of Feng Shui, in particular *ho:go*. Feng Shui helped to build such an ecological village landscape and effectively conserved the landscape until WWII. The hypothesis that Ryukyu village landscapes were established during the mid-1700s seems to be confirmed.

The biggest Fukugi trees found in a small island near Okinawa Island were estimated to be about 373 years old. Fukugi trees more than 300 years are still common on Okinawa Island and nearby islands. Thus, large-scale Fukugi tree planting on Tarama Island came later than in other areas in Okinawa. The isolated location of Tarama Island contributed to the lag of Fukugi tree planting. However, the Fukugi trees more than 300 years old were usually individual trees inside the villages.

Conclusion

Ryukyu Island Feng Shui planning features planted forest belts and winding roads; such an island landscape achieves a pleasant living microclimate and landscape amenities. Both features suggest that a design to mitigate strong winds was the essential principle in sub-tropical island Feng Shui.

The Feng Shui concepts were introduced to the then Ryukyu Kingdom and has been applied to village landscape planning since the mid of 1700 s; the sacred *utaki* sites of the local religion were integrated into the rural landscape design. A Ryukyu island Feng Shui landscape embodies natural factors of flourishing natural forests

and planted trees, and cultural factors of sacred sites, local religion and sacred sites of old spring remains. It combines shapes of patches of greening, corridors of planted forest belts and intersecting roads, scattered spots of water and clustered human settlement. The traditional village landscape embodies the harmony between man and nature in a scene of ‘people living in the forest.’ The similar biological and environmental significance of Feng Shui woods was also reported in China to be the best long-term refugia for biota under little human interference (Coggins et al. 2012).

As well as high scenic attractiveness, the Ryukyu Feng Shui landscape is functional for the mitigation of natural disasters. Forests of Fukugi trees or pine trees have been planted to circle the outer ring of single hamlets or several vicinal hamlets. Such a forest belt was about 13 m wide and ranged from 2 to 4 km in length depending on the number of hamlets.

Combining the limited local documents and ages of the oldest trees examined, it can be inferred that the Ryukyu Island village landscape was accomplished in the mid-1700s. The finding related to the establishment period of prevalent Feng Shui villages is consistent with survey findings reported by Chen and others (see references) (Chen and Nakama 2011) for the other field sites in Okinawa.

An island Feng Shui village is also a planned green island, which can be summarized as a Fukugi tree village landscape or ‘the landscape of happy trees.’ Even now it is not clear why Fukugi was recommended and became widespread among these planned villages. Besides the physical features and suitability of Fukugi as a landscaping tree species in sub-tropical islands, the name ‘happy tree’ as it relates to Feng Shui must have encouraged its planting by the local people.

In this research, Tarama Island was chosen to analyze the landscape elements focusing on the planted groves and forest patches and the integration of the adapted Feng Shui concepts with local religion. Sacred sites of *utaki* and old springs were worshipped and comprise important rural landscape elements. In particular, sacred sites of *utaki* are surrounded by flourishing planted forests. It was found that Fukugi trees comprise the major species in this landscaping. However, pine trees along the streets, along the coastline and mountain ranges and *adan* (*Pandanus odoratissimus*) along the rivers and coasts were also widely found in the existing old documents. Thus, it is notable that greening in landscaping in the then Ryukyu Kingdom consisted of diverse species.

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