

Distribution of Old Fukugi (*Garcinia subelliptica*) Trees in Traditional Cultural Landscapes in Okinawa Islands in Japan

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Abstract: A traditional Feng Shui village landscape in Okinawa features multilayered forest belts closely surrounding the habitat. Fukugi (*Garcinia subelliptica*) trees, Ryukyu pines and other native species were planted to protect the hamlet and the island from strong winds. Among these species, Fukugi distinguishes itself as being long-lived and strong against typhoons and monsoonal winds. Through surveying the distribution of huge remnant Fukugi trees in the old hamlets, this study is to explore when and how such a Feng Shui hamlet was built and the layout that is still a mystery to historians, and further probe into the cultural and historical significances of Fukugi. Through this survey of total 183 hamlets throughout Okinawa Gunto, mainland Okinawa and its nearby 16 small isolated islands, we found that about one third of all surveyed hamlets had huge trees older than 250 yrs., and these hamlets were distributed in a wide area not only on mainland Okinawa but also on the isolated islands. The estimated age of the biggest Fukugi was about 373 yrs. old. Besides, around the houses, Fukugi trees were also found to have been planted around sacred sites and the old public offices. Thus, such traditional hamlets can date back to the 17th Century, and may have been wide-spread throughout Okinawa Gunto since the early half of the 18th Century. All existent huge Fukugi trees were purposely planted. From the standing locations of Fukugi trees around the human habitat, around sacred sites, and even public office sites, it is obvious that the Fukugi tree was considered as an auspicious tree species besides being a useful and strong species.

Key words: traditional village landscape, local religion, old trees, green tourism

1. Introduction

Feng Shui practice is based on empirical observations of the surrounding landform. Its ultimate goal is to achieve harmony between man and nature. Feng Shui originated in mainland China and then expanded to other regions in East Asia. Since Feng Shui was first introduced to the Ryukyu Kingdom in the 14th Century with the earliest Chinese immigrants, Feng Shui has been applied to build a capital, a village, and even a grave. From the limited records of Feng Shui village observations in Makija and Inamine in the old Haneji District and Yaeyama Islands (Ono, 2006; Chen and Nakama, 2011), it is evident that Feng Shui masters assisted in the settlement of a new village and the improvement of village landscapes.

A typical Feng Shui landscape in Okinawa features a multilayered tree planting (Chen, 2008; Chen et al., 2008a). Greening has been emphasized in Feng Shui landscapes for its role in enhancing good energy and keeping back evil energy. How to contain the wind has been the primary concern in island Feng Shui because of the severe natural environment with frequent typhoons and strong monsoonal winds in the winter. In contrast to the symbolic use of tree planting in mainland China and Hong Kong, forest was functionally planted in a large area in Okinawa (Chen, 2008).

Ho:go is an essential word in the Okinawa Feng Shui concept. *Ho:go* literally means an enclosing configuration of embraced protection. In Okinawa, another meaning of *ho:go* is a forest belt being preserved or planted. Village *ho:go*, which constitute pine trees or Fukugi (*Garcinia Subelliptica*) trees, were planted to curve in front of the village and to extend to the east and the west to embrace the village along with *kusatimui* (a local word, “腰当森”, which means natural forest preserved in the back of the village) in the rear (Chen, 2008). *Ho:go* also refers to a forest belt that encircles a house, a village, several vicinal villages, or the coastline, and is called House *Ho:go* (house-embracing forest), Village *Ho:go*, District *Ho:go*, and Coastline *Ho:go*, respectively. Ryukyu pine trees (*Pinus luchuensis*) and *adan* trees (*Pandanus odoratissimus*) were usually planted along the coastline (Chen and Nakama, 2011). Village *Ho:go* was found to be rich in vegetation diversity of originally planted Fukugi trees and *terihaboku* (*Calophyllum inophyllum*) mixed with native species (Chen, 2008).

Fukugi is a tropical evergreen with straight trunk and dense, thick leaves. Fukugi is only found naturally distributed in the Philippines, Taiwan, and Sakishima of Yonaguni, Iriomote, and Ishigaki islands in Okinawa Prefecture. Fukugi trees were planted in mainland Okinawa and its nearby isolated islands.

Fukugi trees might have been recommended to be planted surrounding the houses by the Royal Ryukyuan Kingdom, also called *yashiki ho:go*. Forest belts in the northern and eastern borderline are much thicker than those inside the village, which is greatly attributed to the strong cold northern winds in winter and the destructive eastern wind during typhoon season (Chen et al., 2005; 2008b). In order to keep a pleasant living

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environment, Fukugi trees have been maintained in a proper density of about 2-3 stand trees taller than 1m in every meter of woodland (Chen et al., 2005; 2006; 2008b).

Concerning the house-embracing Fukugi trees, some case studies were reported on the actual layout and density (Chen et al., 2005; 2006; 2008b). In this study, we aim to clarify how far the Fukugi trees have been planted in Okinawa Islands, which have been the political and economical center of the Okinawa prefecture, and the then Kingdom of Ryukyu and how the village structure liked in the modern Ryukyu Kingdom is still too little known due to the lack of historical literature. When and how the villages were built and developed is still controversial among the historians. Fukugi trees which played an important role in protecting the houses and people from natural disasters of typhoon and tsunami are now vanishing rapidly (Shigematsu, 1979). It is urgent to figure out the actual distribution of these huge trees in the islands, and to clarify the original village layout in the Ryukyuan period from the huge remnant Fukugi trees.

2. Methodology

2.1 Survey sites

The traditional Feng Shui landscape with multilayered forest belts vanished from Okinawa Island soon after WWII. The war and the change of house style have been the two major factors that contributed to the felling of the trees. During WWII, war fires burned the trees and lines of trees were clear cut. Local people rebuilt the original thatched roof timber houses into concrete houses, trees around the houses were felled since a concrete house is strong against typhoons, and the shade of the huge trees blocked the sunshine and hindered the growth of garden crops and flowers. During our survey, we were told by some habitants that they plan to fell the surrounding trees. To some local people, Fukugi trees have become useless and unpleasant plants.

Okinawa Prefecture (Fig. 1), Japan's south-westernmost prefecture, is located at lat. 24~28° North and long. 123~132° East. It consists of 49 inhabited and 111 uninhabited islands scattered over an area 1,000km from east to west and 400km from north to south. The islands are divided into three major groups: Okinawa Gunto (island group), the Miyako Gunto, and the Yaeyama Gunto. In this study, we surveyed on the 19 islands besides Okinawa Island which belong to Okinawa Gunto (Fig. 1). Okinawa (1,202 km²) is the largest island with Iriomote (289 km²), Ishigaki (222 km²), and Miyako (159 km²) Islands following respectively.

2.2 Method

We have designed a survey of the big remnant Fukugi trees in all hamlets in Okinawa Gunto (Fig. 2), including Okinawa Island and its surrounding small

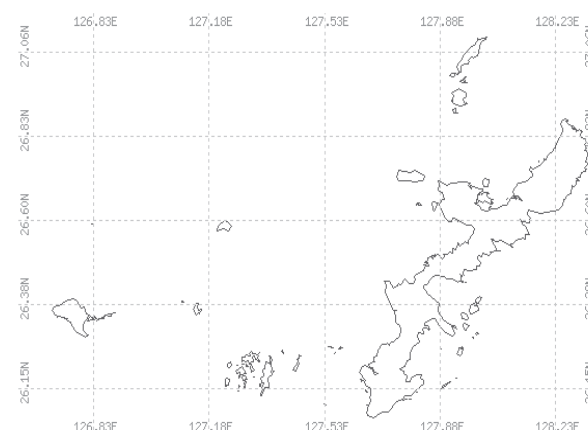


Fig. 1 Map of Okinawa Gunto (Islands)

Source: retrieved on March 5, 2011 from <http://www.ngdc.noaa.gov>.

islands. A hamlet is a survey unit since it is the smallest but holistic landscape planned or ameliorated. In Okinawa, a hamlet is a community based on a territorial band as well as blood relationship. Each hamlet has its own sacred places of *utaki* and *ashagi* or *haisho*. *Utaki* is usually located on the outskirts of hamlets and are places for the veneration of gods and ancestors. *Ashagi* or *haisho* is always located inside the hamlets, where guardian gods were summoned in order to hold ceremonies and rituals. Besides house-embracing Fukugi trees, a few or a group of huge Fukugi trees were also found around such sacred places of *utaki*, *ashagi*, or *haisho*.

Big house-embracing Fukugi trees and big Fukugi trees around the sacred places and the ruins of the old public offices were measured and tallied, respectively. We surveyed a few houses with the best preserved house-embracing Fukugi trees and measured the DBHs (the diameter at breast height) and the heights of the biggest trees in each hamlet. The sacred places of *utaki*, *ashagi*, and *haisho* were all checked, around which the DBHs and heights of big Fukugi trees were measured and tallied.

According to the Ministry of the Environment of Japan, a huge tree is defined as a tree with a trunk circumference bigger than 300 cm at a height of 130 cm above the forest floor. However, for a slow-growing tree species, a trunk circumference smaller than 300 cm is also accepted as that of a huge tree (1991). Since Fukugi is an extremely slow growing tree species, we define a big Fukugi tree as one planted during the Ryukyuan Kingdom Period before 1868. Thus, we surveyed all Fukugi trees with a DBH bigger than 25cm.

The estimated tree age was counted based on the formula [Age (year) = DBH (cm) ÷ 2 × 8] by Hirata (2006). All surveyed house-embracing Fukugi trees were further categorized into four groups (≥250yrs.; 200~250yrs.; 150~199yrs.; 100~149yrs.) based on their estimated ages. A 1:25,000 digital map issued by the Geographical Survey Institute was used to map the

distribution of the largest residual trees. The four groups of surveyed trees were mapped by different hamlets and presented in different colors. The distribution map of Fukugi trees was reproduced with a reference to the residential map published by Zenrin.

3. Results

3.1 The present distribution of huge Fukugi trees in Okinawa Gunto

The biggest Fukugi tree was found in Hamahiga Island to the east of Okinawa Island, now connected by a bridge to the mainland. The biggest tree was 15 m high and estimated to be about 373 yrs. (Photo 1). Lined together with the other two huge trees 270 and 292 yrs. old, it is standing in the north of the courtyard. The old timber house is now used to place the family altar.

The result of the field survey concerning the existing oldest tree in each hamlet (*aza*) was documented. All survey data will be split into three categories of Kunigami Gun, Nakagami Gun and Shimajiri Gun in the north, the middle and the south of Okinawa Islands (Fig. 2). Most of the isolated islands which are more than 30 km from Okinawa Island have been grouped into Shimajiri Gun since the Ryukyu Kingdom Period. Among the total 183 hamlets, about 15 had Fukugi trees older than 300 yrs.; and 54 hamlets had Fukugi trees older than 250 yrs. About 7 hamlets in Kunigami Gun, 6 hamlets in Nakagami Gun, and 2 hamlets in Shimajiri Gun had Fukugi trees older than 300 yrs.. About 16 hamlets in Kunigami Gun, 6

hamlets in Nakagami Gun, and 17 hamlets in Shimajiri Gun had Fukugi trees older than 250 yrs. From Fig. 2, we can see an equilibrium distribution of huge Fukugi trees older than 250 yrs. old throughout Okinawa Island and even isolated islands.

The survey data show that Une *aza* in Kumejima Island has the best preserved house-embracing Fukugi trees, accounting for about 80% of the houses surrounded by the trees. Bise village in the northern part of Okinawa Island and two hamlets in Aguni Island and Tonaki Island have house-embracing tree coverage of 70%. Ten hamlets in Kunigami Gun in the north of Okinawa Island have tree coverage of more than 50%, namely, half of the houses have standing house-embracing Fukugi trees. One hamlet in Izena and two hamlets in Kumejima, which belong to Shimajiri Gun, have a high coverage of more than 50%. The results show that among the total 22 hamlets that had a coverage higher than 30%, only one hamlet was located in the middle part of Nakagami Gun in Okinawa Island, and all surveyed hamlets in the southern part of Okinawa Island had Fukugi tree coverage lower than 30%. In the other words, in the more developed areas, the hamlets had fewer Fukugi trees left.

3.2 Fukugi trees, Goban pattern village

According to Nakamatsu (1977), there exist 182 Goban pattern villages in Okinawa Prefecture, among which, 163 Goban villages are located in Okinawa Islands. About 44 Goban villages were found to have standing house-embracing Fukugi trees older than 100 yrs. (Fig. 3).

Based on the *Kyuyo* and inquiries to the senior villagers, Nakamatsu classified all Goban villages by the settlement age (1977, p. 115-118). Among the total 163 Goban hamlets in Okinawa Gunto, 26 hamlets were newly built or moved to the current sites (Group I), 80 hamlets were moved at an unknown age (Group II), and 57 hamlets had no information on the age or whether they had been moved or newly built (Group III). Our survey data of remnant Fukugi trees show that about 12 villages had Fukugi trees older than 273 yrs. That is to say that these 12 villages among the total 44 Goban villages might have been built before 1737. The five hamlets of Bise in Motobu, Koki in Nagoshi, Maeda in Onna, Tomori in Nakagusugu, and Nakada in Izena Island had Fukugi trees older than 300 yrs. (Fig. 3). The six hamlets of Inamine in Nagoshi, Ikei Island in Urumashi, Asato in Nanjyōshi, Aharen in Tokashiki Island and Zamami in Zamami Island had big Fukugi trees older than 273 yrs. (Fig. 3). All these eleven Fukugi trees were classified into Groups II and III.

Nakama of Onna Village had big Fukugi trees estimated to be 280 yrs., and it was classified as being moved to the current site after 1737. Therefore, the survey data of big Fukugi trees were identical to Nakamatsu (1977). From the big remnant Fukugi tree age, we can also induce that hamlets in Groups I and II



Photo 1: The biggest Fukugi tree found inside Hama of Hamahiga Isl. It was measured as 93.3 cm (DBH), 373 yrs. old and 15 m high. Along with two other big trees, it was standing still healthy in the north of the ground yard of an old house now used to place the family altar.

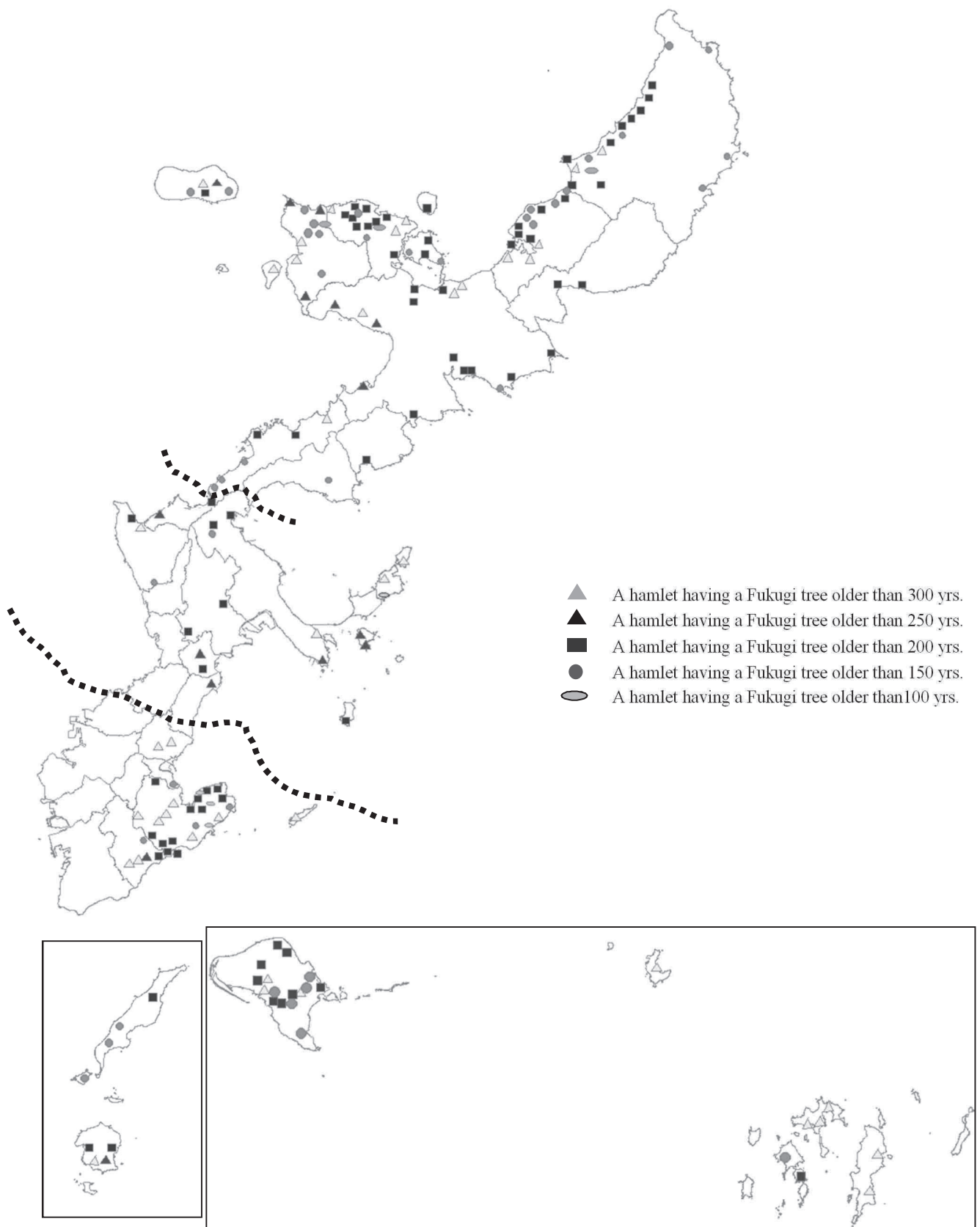


Fig. 2 Different colors mark the distribution of the biggest Fukugi trees distributed in the Okinawa Islands. Scale: 1:50,000

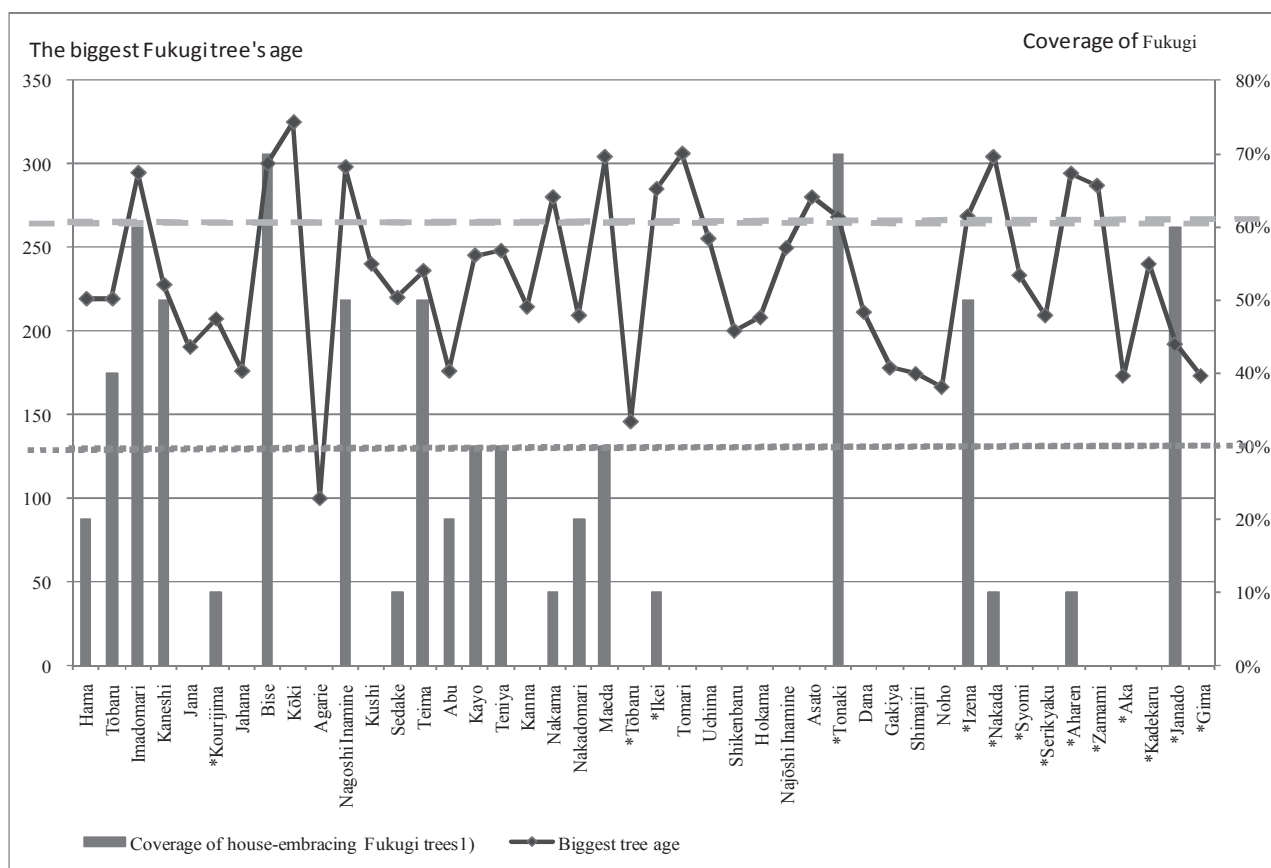


Fig. 3 The biggest Fukugi tree and the Fukugi coverage in a surveyed Goban village.

Note: * refers to the hamlets on isolated islands. A Goban Pattern village, also called a *jiwari* Village. A Goban village features grid order roads. *Jiwari*, was a collectively owned land system in modern Ryukyu. Under the *jiwari* system, all land is collectively owned, used, and managed. The land was allocated and redistributed in a certain period from 2 to 30 years, differing in hamlets.

marked as “settled or moved age unknown” by Nakamatsu were built before 1737.

About eight Goban hamlets had a high coverage of house-embracing Fukugi trees. In these villages, more than 50% of the village houses were surrounded by Fukugi tree lines (Fig. 3). Among them, five hamlets are located in Kunigami Gun, and three are located in the isolated islands belonging to Shimajiri Gun. Another three Goban hamlets have coverage of 30%.

3.3 Fukugi trees in sacred sites

The biggest Fukugi trees found in the sacred sites of *utaki*, *ashagi*, and sacred springs etc. were listed in table 1. *Utakis* and/or some other sacred sites in about 37 hamlets had huge remnant Fukugi trees. At 344 yrs., the oldest tree found was in the *utaki* inside the hamlet of Furugen. The oldest Fukugi trees found in other sacred sites were in Nakaoshi *ashagi* and *Uchima udun*, and were estimated to be 364 yrs. and 348 yrs. old. A huge Fukugi tree in the southern entrance to the Kannonji (the Goddess of Mercy) Temple was measured to be 12m tall and 360 yrs. old.

For most of the sacred sites, one or a few huge Fukugi trees are distinguishable, however, groves of huge Fukugi trees were also found in the sacred sites in Tōbaru *utaki* and *ashagi* (Photo 2), Hiji *ashagi*, and Nakadomari *ashagi* of Kunigami Gun and in Furugen *utaki* of Nakagami Gun (Table 2). Hiji *ashagi* is located



Fig. 4 Location of bansho an old public office remnant with existent Fukugi tree lines

Table 1 Distribution of old Fukugi trees around utaki and other sacred sites

Survey sites			Biggest Fukugi trees in <i>utaki</i> ¹⁾			Biggest Fukugi trees in <i>ashagi</i> and other sacred sites ²⁾		
	City, Town, and Village	Aza	DBH (cm)	Estimated age (yrs.)	Tree height (cm)	DBH (mm)	Estimated age (yrs.)	Tree height (cm)
Kunigami Gun	Kunigami	Ura	613	245.2	959			
		Jyashiki	663	265.2	1140			
		Tōbaru ³⁾	766	306.4	960	766	306.4	960
		Hiji				661	264.4	1480
		Hama				413	165.2	1082
	Ōgimi	Ōganeku	493	197.2	1430			
	Nakijin	Sakiyama				588	235.2	951
		Kamiunten				660	264	1520
	Higashi	Kawata	813	325.2	1000			
	Nago	Kouki				730	292	1180
		Agarie				700	280	1260
		Nakaoshi				910	364	720
		Sedake	712	284.8	1750			
		Teima	462	184.8	1100			
		Teniyu				375	150	700
	Ginoza	Kanna						
	Onna	Nakadomari	733	293.2	1500	625	250	1550
Nakagami Gun	Uruma	Takaesu	636	254.4	1180			
		Yamashiro	410	164	920			
		Yakena	758	303.2	1320			
		Ikei	580	232	700			
	Yomitan	Furugen	870	348	1306			
	Nishihara	Uchima				870	348	1340
Shimajiri Gun	Nan'yoshi	Yamasato				600	240	1390
		Sashiki				595	238	930
	Zamami	Asa	533	213.2	830			
		Ama	587	234.8	960			

*utaki*¹⁾: the sacred site for the guardian god of the village.

ashagi and other sacred sites

²⁾: *kami-ashagi*, is a small building in a sacred place, where guardian gods were summoned in order to hold ceremonies and rituals.

Table 2 Remnant old Fukugi groves in sacred sites

<i>Utaki/Ashagi</i>	Tree number	DBH (cm)		Estimated tree age (yrs.)		Tree height (cm)	
		Maximum	Average	Maximum	Average	Maximum	Average
Tōbaru	21	76.6	47.4	282	189	1172	897
Hiji	20	66.1	42	264	168	-	1480
Nakadomari	20	62.5	42.1	250	168	1550	1450
Furugen	12	86	49.5	344	198	1306	1048

Tōbaru *utaki* and *ashagi* was built in the same place inside the hamlet with surrounding Fukugi trees.

Hiji ashagi is a thatched roofed small building covered by the thick forest, located on the top of the hill at the back the hamlets. Besides planted Fukugi trees, huge *Bischofia javanica* trees also mixed.

Nakadomari *ashagi* is located in the middle of the village now used as public playground and for annual sacred ceremony.

Furugen *utaki* is located inside the village covered by a grove of pure Fukugi forest.

Table 3 Remnant old Fukugi trees in the ruins of *magiri bansho*¹⁾

<i>Bansho</i>	Tree number	DBH (cm)		Estimated tree age (yrs.)		Tree height (cm)	
		Maximum	Average	Maximum	Average	Maximum	Average
Nakijin	20	70.4	51	282	204	1172	897
Nago	6	89.3	74.2	357	297	1660	1383
Kin	21	70	44	280	176	1500	1027
Yanogusuku	23	81	55	324	220	1300	1145
Haeburu	5	69	54.7	276	218	930	860
Tonaki	7	60.3	50	241	200		
Nakazato	37	81.4	50	326	201	1380	1085

1) *Magiri bansho*: *Magiri* (間切) is a specific administrative division unit in Ryukyuan Kingdom. Several hamlets make up a *magiri*. In 1908, *Magiri* was changed to an administrative unit of city, town and village. *Bansho* was an old public office.

preserved as the origin of the hamlet. The other three sacred sites are located inside the hamlet surrounded by Fukugi trees. The average DBH of Fukugi trees in these four sites were estimated to be over 40cm. Fukugi trees were highest in Hiji *ashagi* since they are growing inside the thick natural forest.



Photo 2: A sacred site of *utaki* inside Tobaru hamlet in the north of mainland Okinawa might be the site of an earliest house in the hamlet.

3.4 Fukugi trees in *magiri bansho* (the old public offices)

There existed 35 *magiris* in Okinawa Island in the early modern Ryukyuan period (Umeki, 1989, p. 193). Old Fukugi trees are still existent around the remnants of seven *bansho*, five in Okinawa Island and one in Kumejima Island and Tonaki Island, respectively (Fig. 4 and Table 3). Nakazato *bansho*, also named Nakazato *kuramoto* (Photo 3), has the best preserved Fukugi tree lines in a *bansho*. The current high coral stone walls were built around 1763. The total of 37 Fukugi trees were mostly standing in the east, the north and the west sides of courtyard. Following Nakazato, the old *banshos* of Yanagusuku, Kin, and Nakijin had more than 20 existent huge Fukugi trees. The mean DBHs of remnant huge Fukugi trees in all surveyed six *magiri banshos*,

except in Kin, were more than 50cm.

The biggest Fukugi trees were found to be in the Nago *bansho* ruins, the current Nago Museum. The mean tree age was estimated to be 297 yrs. These Fukugi trees were recorded to have been planted by Jitodai named Yabu (屋部菊陰) in 1695. Yanagusuku *Magiri* was newly built in 1676 (Umeki, 1989 pp.193). From the oldest Fukugi tree age and historical records, these *magiri banshos* were built before or in the late 17th century.



Photo 3: Nakazato *bansho*, also named Nakazato *kuramoto*, has the best preserved Fukugi tree lines. This photo shows the well preserved tree lines in the north of the courtyard.

3.5 The distribution of Fukugi trees in a village

Here, Tonaki Island is taken as an example to discuss how a traditional hamlet has developed from the perspective of Fukugi trees. Tonaki Island is located at lat. 26°22'N and long. 127°8'E, and is 58 km northwest of Naha City. About 70% of houses in Tonaki have Fukugi trees lines surrounding the premises (Photo 4). The traditional timber folk houses with red tiled roof have been well preserved in Tonaki Island. Tonaki still has a typical traditional village landscape which has disappeared in almost all the islands in Okinawa.

All houses-embracing Fukugi trees whose DBHs are



Photo 4: The ordered lines of house-embracing Fukugi trees have their crowns crossed over the village roads, and provide with a shade in the hot summer.

bigger than 10cm were surveyed in Tonaki. The statistical data are showed in Table 4. A total of more than 7,500 Fukugi trees were surveyed in Tonaki Island. We found that, altogether 11 trees older than 200 yrs. were in the eastern part of the habitat. Fukugi trees in the eastern part were older than those in the western part (Fig. 5). The distribution of Fukugi trees was consistent with the record in *Tonakison Shi* which mentioned that the hamlet was first settled in the eastern part and then moved to the western part.

Table 4 Number of Fukugi trees found in Tonaki

	Tree Number	Number of the houses distributed
older than 250 yrs.	2	2
200~249 yrs.	9	7
150~199 yrs.	112	59
100~149 yrs.	842	165
40~100	6733	251
Total	7698	251

Four *haishos* out of the total five inside the village are located in the eastern parts. *Haisho* is also the sacred place where guardian gods were summoned in order to hold ceremonies and rituals. It is obvious that houses in the current residential site were built in the eastern part in earlier years, and then were moved to the western part of the village. The grand Harvest Festival in summer is also held in the eastern part each year. The village originated in the eastern part.



Note: the dark circles show the location and tree number of Fukugi trees older than 200 yrs.

Fig. 5. Distribution of huge house-embracing Fukugi trees older than 100 yrs. inside Tonaki village, which is located on Tonaki Island about 58 km northwest of Naha City.

4. Discussion and Conclusions

4.1 Distribution of huge remnant Fukugi trees and features of a Ryukyu green Feng Shui village

House-embracing Fukugi trees were found to be distributed in a wide area in Okinawa Gunto. Altogether, 183 hamlets were found to have Fukugi trees older than 100 yrs. Fukugi trees older than 250 yrs. were found to be distributed in the northern, middle and southern areas of mainland Okinawa and even in isolated islands. The total of 15 hamlets which had Fukugi trees older than 300 yrs. are distributed throughout the whole area of Okinawa Island and two isolated islands to the north of Okinawa Island. The wide spread of existent Fukugi trees suggests that Fukugi trees planting around the houses dated from the late 17th century.

Concerning the preservation of house-embracing Fukugi trees, we found that the northern area in Okinawa Island, Kunigami Gun, and isolated islands in Shimajiri Gun have a higher coverage of Fukugi trees. The middle and southern areas in Okinawa are more developed areas and urban sprawl might have contributed to the disappearance of Fukugi trees after WWII.

Inside a hamlet, we found that older trees were distributed in the earlier settlement. These old hamlets are laid out with the center of sacred sites of *haisho*. The hamlet was laid out with the center for sacred rites.

Besides the human habitat, Fukugi trees were also planted in some other important places, around other sacred sites such as *utaki*, and *ashagi*, and even around the old public offices. Fukugi is connected to sacred sites as well as institutional sites and is distinguishable from other tree species in Okinawa. If translating “Fukugi” directly to English, it would be “lucky trees,” although, no related historical record has been found.

The Chinese character for luck (福) might be first made from the Ryukyuan pronunciation by the Investiture missionary named Xu Baoguang (*Chūzan denshinroku*). From the survey results, it is obvious that Fukugi tree has been strongly considered as auspicious tree species since the late 17th century. However, the wide range and uses of Fukugi tree might be more connected to its natural features.

A Feng Shui village in Okinawa is a holistic landscape which includes the natural factor of the prevalent tree planting and the cultural factor of the traditional religion and sacred rites. A Feng Shui village with planted forests was completed by the middle of the 18th century under the strict instruction of Sai On. In contrast to the Feng Shui practice in mainland China and Korea, village landscapes were rebuilt in order to enhance the productivity. Fukugi trees were spread throughout the Okinawa Islands because they can be used for timber. The Feng Shui landscaping can be considered to be one of Sai On's ambitious policy packages to improve the Ryukyuan material standard of living.

4.2 The process of an orderly laid out hamlet in the modern Ryukyuan Period

An orderly laid out hamlet, also named *jiwari* hamlet, was called Goban Pattern village by Nakamatsu who concludes that such hamlets were newly built after 1737 (1977, p114-118). *Jiwari*, was a collectively owned land system in modern Ryukyu. Under the *jiwari* system, all land was collectively owned, used, and managed. The land was allocated and redistributed in a certain period varying from 2 to 30 years, depending on the hamlets. From the survey result on the huge remnant Fukugi trees, we can infer that the orderly laid out hamlet might have existed before 1737.

Fukugi tree planting around the houses or inside the hamlet might date back to the 17th century. Feng Shui quickly spread from *kumemura* to affect many aspects of life, e.g. village landscape. While Sai On was in power from 1737-1750, Feng Shui was used to guide the timber production in the forest. Hamlets were newly built, moved, or reformed based on Feng Shui principle. From the wide distribution of huge remnant Fukugi trees older than 250 yrs., it can be inferred that the royally recommended Fukugi tree planting around the early 18th century. *Kōson Family Genealogy* (公孫姓家譜) recorded that trees around the courtyard in the house of Maja hamlet in Kumejima were cut to plant Fukugi trees in 1751. At present there exist 14 huge Fukugi trees in the north direction of the courtyard which were measured, and among which the biggest was estimated to be around 244 yrs. old. The measured Fukugi tree age is consistent to the record of its planting.

4.3 The future of Fukugi trees

What a Fukugi tree is like is not included as a

major aim of this study. But the field survey throughout Okinawa Island and its nearby isolated islands helps to reveal some of the natural features of Fukugi trees. First, huge Fukugi trees found in Okinawa Gun were planted for particular purposes by the ancestors. No naturally growing huge Fukugi trees were found in Okinawa Gunto. Secondly, Fukugi trees do not grow more than 18m high. The biggest Fukugi trees were found to have a DBH of around 80-90 cm. Thirdly, Fukugi trees seem to grow well in all kinds of soil.

However, *Cryphalus garciniae* Nobuchi has started to spread out in northern Okinawa, threatening the health of the huge remnant Fukugi trees. Besides this pest, humans are the biggest threat to these Fukugi trees. In contrast to the wide range and various uses of Fukugi trees in Ryukyuan history, forest researchers know little about this species; forest specialists in the prefecture office consider it to be a useless tree species which does not bring forward direct economic profits; and further, most of the villagers do not like them and felling is planned. The research is designed to arouse the consciousness of local people and the local authorities to preserve these trees and for the purpose of cherishing and restoring the original village landscape in Okinawa. Thus, in order to preserve the residual green belts in the hamlets, it is vital to recover the historical and cultural significance of Fukugi trees.

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