Aerial view of Kikai Island © Kikai Town Office

Chapter 7

Becoming an Agricultural Island

Kikai

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Village by the seashore

Kikai, located in the Pacific Ocean just off the northeast shore of Amami Oshima, is 380 kilometers from Kagoshima City and 69 kilometers from Naze City. It has an area of 57 square kilometers and a circumference of about 49 kilometers. It is 14 kilometers long from its northeast tip to its south-southwest tip and 7.8 kilometers wide. The greater part of the island is uplifted coral reef and almost the whole island is covered with Quaternary limestone.

The island reportedly rises between 1.5 and 1.9 millimeters per year. Almost none of the flora or fauna on the island appears to be aboriginal. This is because after the island broke away from the continent, it subsided into the ocean but rose to the surface again as an uplifted coral reef. There are no vermin like the

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venomous habu snakes. Nor is there any precipitous topography that prevents people from entering. Kikai is a very comfortable island for humans.

Villages are situated along the coast with farmland behind each village. Slightly to the east side, a ridge called the Hyakunodai Hills runs like a spine along the length of the island and slopes gently from east to west. Its highest point is 225 meters above sea level. Kikai is relatively flat with almost no rivers or streams. The climate is mild. During the thirty years from 1966 through 1995, the annual mean temperature was 22.4 degrees Celsius and the annual mean rainfall was 2,230 millimeters.

Although over twenty thousand people lived on the island before World War II, the population started to rapidly dwindle after the end of the war. Only 9,296 people remain today. About thirty percent of the population is concentrated in the southwest part of the island in two towns called Wan and Agaren. Depopulation, aging and a low childbirth rate are very conspicuous in almost all of the other villages.

In 1466, the Ryukyu Kingdom subdued Kikai and ruled the island for the following 150 years or so. In 1609, the Shimazu Clan conquered the Ryukyu Kingdom and took over rule of Kikai for about 260 long years until 1871 when today's prefectures were established to replace the feudal domains.

At the end of World War II in 1946, the United States Armed Forces separated Kikai from Japanese administration and occupied the island for about 8 years. But on December 25th, 1953, along with Amami Oshima, Tokunoshima, Okinoerabu and Yoron, Kikai was returned to Japan.

Heike and Genji Soldiers on Kikai

Kikai folklore describes numerous interesting visitors including the military commander Tametomo Minamoto of the Genji Clan, the famous Buddhist priest Shunkan, and deserters of the Heike Clan.

A fountain exists on the island called *Karimata no Izumi* (the Forked Arrowhead Fountain). According to folklore, the military commander Tametomo arrived on the island at a village called Onotsu on the northwest shore. As he was approaching the shore, he shot a forked-headed arrow onto the island to determine if anyone was there. Seeing no reaction to the arrow, he came ashore and pulled out the arrow from the ground, but when he did, fresh water gushed out.

It is speculated that before long, Tametomo sailed across the water to Amami Oshima after noticing its immense silhouette to the west, and that he continued on to the Ryukyu Islands via Tokunoshima and Okinoerabu.

According to other folklore, a group of Heike Clan soldiers deserted their posts the night before the naval battle at Dannoura in the Nagato Domain (northwestern Yamaguchi Prefecture). They sailed from the Buzen Domain (eastern Fukuoka Prefecture and northern Oita Prefecture) to southern Kyushu, and then south to Kikai via Yaku Island. The Heike soldiers resided on Kikai for three years during which time they discovered the colossal Amami Oshima nearby. Finding out that Amami Oshima had no lord, they approached the island on three sides by ship and attacked.

After the Heike soldiers subjugated the whole island, it is believed that Heike General Sukemori constructed a castle in an area called Shodon on Kakeroma, which is an island immediately southwest of Amami Oshima. Heike General Arimori is believed to have settled down in an area called Uragami in the city of Naze on the northern part of the island. And Heike General Yukimori is believed to have constructed a castle in an area called Toguchi in the town of Tatsugo on the eastern part of the island.

Other folklore describes Shunkan the Buddhist priest. An archaeological investigation was even conducted to substantiate the folklore. From the folklore about Genji and Heike soldiers on the island, we can speculate that Kikai actually did experience samurai and pirate assaults that are not disclosed in standard history books. Pirates from Bonotsu, which is a pirate base in the Satsuma Domain, used to pass through the Nansei Islands on their way to Guangdong and Fujian in China. Judging from folklore about Genji and Heike soldiers on Kikai, it is believed that the pirates were armed and also stopped at the Amami Islands a number of times.

Folktales about the deserters of the Heike Clan are found in about sixty or seventy areas throughout Japan. In all

cases, it is assumed that feelings of affinity for the faraway capital and for the heroes who escaped a gruesome finale are the motives behind such folktales. It is also assumed that pride in linking their family lineage with nobility is another factor that fosters the folklore among the people of those areas.

That is especially true for the Amami Islands because the islanders used to believe in Neriya, a sacred abode of the gods on the other side of the ocean. So it is assumed that such affinity and pride most likely played an especially important role in fostering such folklore on the islands.

High Priestesses from Ryukyu

As in the Genji and Heike folklore, visitors from the mainland islands had a great impact on the folkloric culture of the Amami Islands. But the deluge of Ryukyuan culture during the period of Ryukyuan rule had an even greater impact. During this period, the inhabitants of the Amami Islands adopted Ryukyuan culture for food, clothing, shelter and all other aspects of daily life.

But they did not adopt the performing arts of the royal court such as classical dance and classical music. Instead, the islanders were more interested in the performing arts of the common people and in what could be adapted to practical use such as material things, cooking methods, business methods and fishing methods.

The main reasons the Ryukyuan king subjugated the Amami Islands were to acquire the conveniently located harbors as relay points on his trading route and to

Village path flanked by stone walls © Sueo Kuwahara

acquire fishing rights in the area. He had no intention of lording it over them.

Since ancient times on Ryukyu, when a person who had rendered distinguished service was appointed to a district, women such as his wife, sisters or females of powerful families on Ryukyu were appointed as *noro*s (high priestesses) and sent along with him. The *noro*s were entrusted with all religious services and were also given political responsibilities.

The person in charge of controlling the high priestesses and dispatching them to the Amami Islands was Her Majesty Kikoe in Shuri, the capital of the Ryukyu Kingdom. The king of Ryukyu controlled

religion on the Amami Islands through this organization of *noros*.

Believed to be guardian spirits of the chiefs they served, *noros* gained the faith of the farmers and seamen of the islands. It is speculated that the *noros* also had the role of collecting land tax for their chiefs from the believers. Descendants of *noro* s still exist today everywhere on the Amami Islands, including Kikai, and the apparatuses used by the *noros* in religious services are still found in many villages.

Administrators and Exiles from Satsuma

During the period of Satsuma rule, administrators from the Satsuma Domain arrived at Kikai to set up the Satsuma administration. They monopolized sugar and demanded enormous amounts of sugar as tax payments from the islanders.

From 1753 to 1755, the Shimazu Clan received a mandate from the shogunate to undertake the difficult task of repairing the Kiso River. The clan had to borrow a great deal of money for the task and had trouble regaining good financial standing. Still worse, the extravagant lifestyle of Shigehide Shimazu, the feudal lord, drove the clan deeper into debt. So in their efforts to replenish their battered finances, the Shimazu Clan looked to the sugar on the Amami Islands as their source of revenue.

According to the records, in 1789, the Shimazu Clan designated the Amami Islands as islands of exile. Most of the exiles were political offenders and the like. The more serious the offense, the farther from the mainland the island of exile would be, so Amami Oshima, being the closest island of the group to mainland Kyushu, was the island for those who committed the lightest offense. Those who committed a more serious offense were exiled farther and farther away to Kikai, Tokunoshima and Okinoerabu respectively.

Some of the exiles were men of high learning. For example, Sagenta Nagoya was an exile. He was the author of *Nanto Zatsuwa* (Notes on the Southern Islands), which contains extremely valuable historical source material about the Amami Islands. Yasutsugu Shigeno, who was a doctor of literature, was another exile, and the list goes on.

Many of the exiled samurais on Kikai contributed to the education and cultural development of the islanders. One of the clansmen exiled to the island in 1809 was the great scholar Kian Ijichi. It is said that when the islanders found out about his great learning, they built a small house for him and welcomed him as the mentor of their children. Ijichi contributed immensely to the education of the islanders until he was allowed to return to the domain three years later.

Before that time, during the Kanen

Era (1748-1751) on December 25th 1750, Shozo Ebihara and ten other exiles arrived to Kikai. They had been banished from the domain after they were arrested for suspicion of being Christians during a secretly held worship. Being a knowledgeable man, Ebihara also taught the island children how to read and write and was highly respected by the islanders. But it is said that he lived his remaining days on that lonely remote island.

Near the end of the shogunate in April 1862, Shinpachi Murata arrived to Kikai as an exile from Satsuma and lived in the village of Wan. Murata was one of Takamori Saigo's comrades who fell into disfavor with Hisamitsu Shimazu and were exiled mostly to Tokunoshima and Okinoerabu. Murata would gather the neighborhood children together and teach them how to read and write. Sometimes he would also teach the young men jujitsu and sumo at their request.

Textbooks that Murata wrote with his own brush reportedly are preserved in the houses of his disciples of those days. He also often composed Japanese poetry (*waka*). Two of his poems are said to be preserved at Toen Kijima's home, which was his temporary abode. In 1864, the first year of the Genji Era, Saigo was allowed to return to the domain and so Murata left the island to accompany him. The islanders erected a stone monument to commemorate Shinpachi Murata and they still pay homage to him today.

So in that way, many exiles, including Takamori Saigo, contributed somewhat to the development of education and culture on the Amami Islands during the period of Satsuma rule. Even though they were under special restraints, the exiles on the Amami Islands worked dedicatedly towards the improvement of the culture and the enlightenment of the inhabitants of the Amami Islands.

All throughout the periods of rule by the legendary Genji and Heike Clans, the Ryukyu Kingdom and the Satsuma Domain, many visitors from the faraway world on the other side of the ocean visited Kikai and the other Amami Islands. Culture and information never stopped coming in from the outside. Kikai's relationship with the outside world is still much the same today. But now that the Information Age has begun, Kikai has also started to transmit information of all sorts to the outside world.

Agricultural Island

"The main industry of this municipality is agriculture. To promote its development, we aim to modernize farm management and the conditions for agricultural production and actively promote agriculture of high productivity." That is a quote from the Kikai Long-term Comprehensive

Development Plan, which was mapped out in 1970. And as established by the plan, from the early stages, industrial development based on agriculture has been the main idea behind regional development on Kikai.

"Agricultural island," which is an expression that came into use in 1972, describes the concept of developing agriculture on Kikai with sugarcane as the main crop. Agricultural development on Kikai involved surmounting two major environmental problems. One was the preparation of the farmland and the other was obtaining an adequate supply of water for agriculture.

Consequently, these two problems were given top priority in the Amashin (Amami Islands development) operations in the town of Kikai. Because agriculture was seen as the engine of regional development, an urgent need was recognized for preparing farm fields, which are the basis of agricultural production. By 1998, 88.5% of the farm fields and 68.4% of the farm roads planned had been successfully prepared.

The problem of water shortage resulted from the island's geological structure. The island is covered with porous Ryukyu limestone and the entire island surface is one gently sloping flat area with almost no hills or valleys, so the water quickly permeates below ground.

In that milieu, the idea of constructing an underground dam was proposed as a national government undertaking. The

Sugarcane field

Kikai Underground Dam Plan was adopted in 1973, construction began in 1992, and the cut-off wall of the underground dam was completed in 1999. Today, construction of the reservoir and the pipeline to transport the water is underway. Through prefectural management, completion of all irrigation facilities is forecast for 2010.

When the underground dam is completed, the yield of sugarcane and the secondary crops, along with flowering plants and garden products, is expected to increase. While working on those two tasks of preparing the land and developing the water supply, the administration is aiming to increase the scale of production by bringing in large-size machinery. It is also aiming to solve two more problems: the

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decreasing number of farming households and the aging of the people.

Highly mechanized sugarcane mill © Sueo Kuwahara

Harvesting sugarcane © Sueo Kuwahara

Best Sugarcane on Amami Islands

On Kikai farms, the cultivated area allotted to sugarcane per farming household is the largest and the yield per ten acres is the greatest in the Amami Islands. Compared to other crops, sugarcane is easy to plant and harvest and is not easily affected by climate, so numerous people throughout the Amami Islands are engaged in the sugarcane industry. The administration is also cooperating in a diversity of ways.

Sugarcane was first introduced to Amami Oshima when a man named Kawachi Sunao from the village of Yamato on Amami Oshima brought some back from Fujian China in 1609. The same man also showed the islanders how to make sugar from the sugarcane. There are indications that sugarcane was grown on Okinawa before that time, but records indicate that sugar production was not known on the

island until 1612.

Farmland considered ideal for commercially growing sugarcane has an annual mean temperature of at least 20 degrees Celsius, no frost, enough rainfall during the growing period, and continuing clear and dry skies during the ripening period. The ideal geographical range for sugarcane plantations is between 35 degrees north latitude and 37 degrees south latitude, but even in such temperate tropical regions, land is not suitable unless the climate has distinct dry seasons and rainy seasons.

Sugarcane is considerably resilient to droughts, typhoons and salt damage, so sugarcane is the most suitable crop for the Nansei Islands, which are often hit with severe droughts and typhoons. In fact, decreases in yield never exceed thirty percent on the islands.

The longer the duration of sunlight, and the hotter and more humid the climate, the greater the yield becomes. Incidentally, the average yearly rainfall on the Nansei Islands is from 1,800 to 2,500 millimeters, which is very close to the ideal of 1,500 to 2,000 millimeters for sugarcane cultivation. Kikai is very suitable for sugarcane cultivation because it has an average yearly temperature of 21 degrees Celsius and a subtropical oceanic climate.

In 1995, the number of persons in the agricultural workforce amounted to 28% of the total workforce of the primary, secondary and tertiary industries. This percentage is almost the same as it was fifteen years earlier in 1980. In the 1997 statistics, there were 1,076 hectares of sugarcane fields on Kikai. That amount was about half of the island's total cultivated area of 2,130 hectares. The statistics also show that the cultivated area allotted to sugarcane per farming household was 1.3 hectares in 1980, but increased to 2.1 hectares by 1995.

The yield was over a hundred thousand tons in 1989 but dropped to less than a hundred thousand tons the following year and is now fluctuating at around eighty thousand tons. According to 1996 statistics, Kikai's total output for agricultural products yielded 2.165 billion yen in 1996. Sugarcane accounted for 74% of that. Sugarcane farming in Kikai has the highest actual yield, production volume, and per capita production of all municipalities in the Amami Islands.

According to the general accounting statistics for Kikai finances in fiscal 1997, however, only 14.2% of the annual revenue came from independent revenue sources. The remaining 85.8% came from dependent revenue resources such as tax money received from the national government. Although Kikai is aiming to become an agricultural island, like the other islands of the Amami Islands, the actualization of a self-sustaining economy remains a difficult problem and is not foreseeable in the near future.

Super-Aged Society

The 1990 national census showed the population of Kikai Island to be 9,641, which was the first time it dropped below 10,000. The population was 9,360 as of December 1, 1999. It had started diminishing steadily after 1955. By 1995 the population dropped to 57.8% of what it was before the beginning of the decline.

From the 1995 national census statistics in which the population is divided into three age segments, namely "under 15," "15 to 64" and "65 and up," we can see that the young generation has been flowing out during the high growth period of the economy. We can also see that the proportion of the "65 and up" segment is high and rapidly rising on the Amami Islands, which are undergoing a population drain.

For Kikai, the "65 and up" segment occupies 29%, which is a higher percentage than for any other municipality in the Amami Islands. Other statistics in the

Party in the evening

Singing together

national census indicate that the elder members greatly outnumbered the younger members of the agricultural workforce on Kikai in 1995, with 45% "under 60" and 55% "60 and up." From 1990 to 1995, there was a 13% decrease of agricultural workforce of the total, but a 8% increase for the "60 and up" segment.

In the statistics for 1997, Kikai had an agricultural workforce of 1,540 people of whom as many as 55% were "60 and up." Only 23% were "50 or under." At this rate, 70% of the agricultural workforce will be "60 and up" in ten years.

In 1970, Japan became an "aging society" when its "65 and up" segment reached 7%. And in 1995, Japan became an "aged society" when the segment surpassed 14%. (According to United Nations criteria, an "aging society" has a "65 and up" segment of at least 7%, while an "aged society" has a "65 and up" segment of at least 14%.)

The Ministry of Health and Welfare Institute of Population Problems estimates that Japan's "65 and up" segment will surpass 20% in 2010. The institute forecasts that Japan will beat out all of the aged societies of advanced nations in Europe and America to become the world's first "super-aged society." One out of four people will be at least 65 years old.

A 1999 survey of municipalities shows that the "65 and up" segment on Kikai has reached 31.2%, which is considerably higher than the other municipalities in the prefecture and in the country. This is quite an increase over the 29% figure for 1995.

Agricultural Island's Future

These statistics clearly indicate that the agricultural workforce is diminishing and that the workers are aging. The challenges now facing the islanders are to increase their productivity and create an agricultural system that supports the farming households.

Two necessities have been pointed out for agricultural development in the region. One is the promotion of effective utilization of the land, machinery, facilities and manpower for the agriculture in the whole region. The other is the establishment of an integrated system in which municipalities and agricultural cooperative associations help farming households set up their farm management.

It was decided that the farmers' net income for sugarcane would be 20,450 yen per ton from 2000 through 2001. The national government is purchasing the sugarcane at eight to nine times the price of imported raw sugar. Moreover, as with rice, there is no production adjustment, and there is no need to fuss over dispatching or securing marketing outlets, or to worry about market conditions.

In the future, farming households will increasingly receive work from third sector agricultural development cooperations and from farming groups that are in the process of being formed in each community. In the work operations, the farmers will be planting and managing the sugarcane themselves, using sprinklers from the underground dam reservoir for the watering, and operating harvesters for the harvesting. This setup will make it much easier for the old farmers. For that, a system to make it easier for farmers to borrow or buy farmland will become necessary and farm roads will have to be widened.

Moreover, in the regional development plans of the administration, the direction of agriculture on Kikai will be toward the promotion of a compound type of agriculture. The agriculture will combine garden products, livestock and other highly profitable products in line with the trend of demands on the market. Today, progress involving a diversity of elements is also being made in the production of flowering plants, vegetables, fruits, beef cows and other crops.

Chrysanthemum cultivation especially has been progressing in recent years. Some areas particularly are pouring energy into it as a means of regional vitalization. Kikai's production of sesame, which is also widely cultivated, is the highest in Japan. Further growth is forecast for such additional crops through combined operations with sugarcane.

Sesame, Keraji oranges (a variety of orange endemic to Keraji village), *tankan* oranges, chrysanthemums and numerous other crops on Kikai are considered to be worthy of further support, and now that we are entering the 21st century, the time has come to consider them. But in the midst of an aging workforce, such potentially profitable development will amount to nothing unless more young people join in to carry on the operations.

A great number of the young islanders are now engaged in the construction of the underground dam. Over ninety percent of the farmland is now prepared. When construction of the dam is completed in 2003, the only big operation left to accomplish will be the village drainage system.

Problems still requiring solutions involve agricultural land and machinery and funds for daily life until all the projects are underway, so that the young people can smoothly make the transition into the world of agriculture. For that, it will be necessary to involve the farming groups that I mentioned earlier and to work on accumulating farmland and making it easier for the young people to lease or buy farmland.

Agricultural machinery will be purchased and controlled jointly with the farming groups. Agricultural improvement funds, Amami Islands Development Funds and other funds should be used to the fullest extent. And when agriculture on Kikai develops sufficiently to survive without subsidization, Kikai will be dazzling.

Bullfight ring © Studio Kagawa

Chapter 8

Island of Longevity and an Enthusiasm for Bullfights

Tokunoshima

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Statue of Shigechiyo Izumi ©Kazutaka Nakano

It wasn't until Shigechiyo Izumi became famous as the oldest person alive that the name of Tokunoshima Island became known throughout Japan. To tell the truth, being born and raised in Tokyo, I was hardly able to distinguish Tokunoshima from Amami Oshima until I moved to Kagoshima City about twenty years ago. And along with multitudes of other people, I became increasingly familiar with the island's name and location on the map as a result of Shigechiyo Izumi getting listed in the *Guinness Book of Records* in 1979.

At that time, in the unfolding of internationalization in Japan, Guinness Beer had just been widely released to the Japanese market, and on the same bandwagon, the existence of the Guinness Book of Records also become widely known. So for the first time, Japanese were able to appreciate the grandeur of a name listed in the book.

Shigechiyo Izumi also became a popular figure in the other media. In fact, Prime Minister Suzuki stopped at Tokunoshima in 1981 on his way back from Okinawa and exchanged friendly words with him at the airport on the island.

Although there was no absolute proof that he was as old as he claimed, through the Guinness Book, Tokunoshima became known as an island of longevity to the world. Incidentally, the old man died in 1986.

As with the other islands in the Amami Islands, the society on Tokunoshima is an aged society. In fact, the "65 and up" age segment occupies 24.6% of its population and more than ten people are, at least, a hundred years of age. And as is common with elderly people, the females greatly outnumber the males. Incidentally, Kamato Hongo, who lives in Kagoshima City, became the oldest person alive in Japan in April 1999. She also is originally from Tokunoshima.

Culture

The next thing to Shigechiyo Izumi that is representative of Tokunoshima is the islanders' enthusiasm for bullfighting, which is said to have a tradition of several hundred years. Throughout Japan, there are a number of regions with bullfighting traditions, including some of Tokunoshima's neighboring islands. Tokunoshima may not be the most flourishing place for bullfighting in Japan, but the Tokushima Islanders' enthusiasm for it is really something.

There are almost ten bullrings of various sizes on this moderately sized island. Bullfighting events are held during the New Year's holidays, during the consecutive holidays in May, in October, and sometimes in midsummer. It is not rare for well over a thousand spectators to cram in to see bullfights, even though the

admission fee is not very cheap.

The basic bullfighting method is to put the heads of two bulls together and have the bulls push each other. The horns naturally become weapons. The match is over when one of the bulls loses his will to fight and runs away. It is also effective for one bull to ram the other against the fence. It is the job of people called *sekos* to pit the bulls against each other and provoke their fighting spirits.

When the match ends, the supporters of the winning side shout "*Waido! Waido!*" as an expression of joy. Incidentally, the islanders are also fond of singing *minyo* (traditional folk music) with the name of *Waido-bushi* (melody).

Tokunoshima bullfighting has become international. Since 1999, three Tokunoshima bulls have been sent to Korea during two consecutive years to fight Korean reddish bulls. The bullfights, which were billed as Korea-Japan Showdowns, are said to have been major events in Korea. Reportedly, tens of thousands of spectators crammed into the bullring of an area near Pusan that had been little known until these Korea-Japan events were held. We should take into account the historical basis for distinctive

Bullfight ring ©Studio Kagawa

feelings there towards Japan.

The result of the bullfights is that the bulls from Tokunoshima, which were of medium standing on Tokunoshima, broke even with Korean bulls of their grand champion class. However, one unfortunate part of this exchange between Japan and Korea is that the Tokunoshima bulls cannot return to Tokunoshima due to animal quarantine regulations. But as a result of the bullfighting showdowns, Tokunoshima is now attracting visits from Korean goodwill envoys and there are clear signs of deeper friendship to come between Japan and Korea. That will be a good thing if it attracts more tourists to the island.

It must not be forgotten that diving spots in coral reef regions of the Nansei Islands are an attraction to many tourists. On Tokunoshima, there are diving spots near the airport, at the northeast tip around Cape Kanami, and at the east shore. There are also seven businesses that cater to divers.

One of the appealing points of diving around Tokunoshima is that diving is possible both inside and outside the coral reefs. Another appealing point is the teeming profusion of life forms seen around Tokunoshima in the water, which is the merging point of elements of the north with elements of the south. The best time for diving is around July when the ocean is calm except for when a typhoon happens to rampage through the region.

If more divers start visiting the island, more diving spots can be newly opened for them, but as with the number of other visitors, the number of visiting divers is also stagnating. According to some people in the business of catering to divers, however, the way it is now is ideal for getting the fullest enjoyment out of diving and that a rapid increase of divers would not be favorable. The ocean around Tokunoshima now maintains a sound balance between development and natural conservation.

Tokunoshima recently had an opportunity to become particularly widely known. Naoko Takahashi, nicknamed "Q-Chan" in Japan, won the gold medal for the women's marathon at the Sydney Olympic Games. Q-Chan used Tokunoshima as her training base twice before the Olympics, and after she won the gold medal, her training on the island became a popular topic of conversation. In her honor, thirty-one kilometers of the circuit road that she always used for training was named "Naoko Road" in April 2000. The town of Amagi in the area erected a monument with that name.

A yearly triathlon is held on a Sunday between the last ten days of June and the first ten days of July at Amagi. Preparations for the 14th triathlon to be held this year (2001) are progressing smoothly. A limit of six hundred people is allowed to participate and the number is almost always reached. Including the participants and the people who accom-

Naoko Road monument ("Gold Medallist Naoko Takahashi" part added after she won the Sidney Olympic championship) ©Kazutaka Nakano

pany them, over a thousand people visit the island for the event.

It is not only the Amagi townsfolk who manage the triathlon. A system is set up in which volunteers from all over the island pitch in and help. The event is considered to be a positive element in vitalizing the island. Now that Q-Chan has used the same road as part of her training course, the number of applicants is expected to skyrocket. But considering the characteristics of the competition and the safety aspects, the number of participants allowed to compete cannot be excessively increased.

Winner of 2000 Triathlon in Tokunoshima reaching finish line ©Amagi Town Office

Nature

Viewed from a distance, a few gently sloping mountains can be seen on Tokunoshima. The tallest mountain, called Mount Inokawa, is in the center of the island and rises 645 meters above sea level. It is the second tallest mountain in the Amami Islands. Another tall mountain is Mount Amagi, which rises 533 meters high in the northern part of the island.

The top part of Mount Inokawa has been designated as an Amami Gunto Semi-National Park. It is rather thickly covered with a forest of broad-leaf evergreen trees such as those of a genus (*Castanopsis*) akin to chinquapins and oaks, which are both representative of the natural vegetation of this region. There has been practically no commercial use of such mountaintop natural forests in recent years. Mount Inokawa receives enough rainfall every month so the woods are well preserved wherever the soil is deep.

As with Amami Oshima, innumerable *habus*, which are venomous snakes that attack humans, dwell in the forests of Tokunoshima. From what I hear, that is one reason many people do not rashly enter the forests. That might be a slight disadvantage for eco-tourism that features the atmosphere of a luxuriant forest.

The gently sloping surface of the island from sea level to a height of about two hundred meters contains many terraces and is covered with farmland. The island gently slopes from the southern area throughout the western coast. Parts of this region contain great amounts of coral remains. The surface layer is formed from weathered limestone and is yellowish brown. And below it is a wide expanse of reddish soil.

Granite forms the rock layer under the soil in the mountainous region that divides the northern area from the central area. The core of Mount Inokawa is made of rock formed in the Paleozoic Era.

Industries

According to official statistics, the total tillable area on Tokunoshima is 6,940 hectares, which is 28.1% of the total area of the island. The average cultivated area per farming household is 1.86 hectares. In the crop breakdown, the area under sugarcane cultivation is by far the largest with 4,531 hectares, which is 78.4% of the total area of 5,779 hectares under cultivation. The total area of paddy fields is 4 hectares.

Sugarcane production specialists were first stationed in Tokunoshima in 1735 during the mid-Edo Period when the Satsuma Domain was promoting full-

scale sugarcane production on the island. In 1830 during the last part of the Edo Era, the islanders were forced into a compulsory sugarcane planting system that they considered extremely unreasonable.

In the same year, 1830, the Dutch colonial government on Java also began to enforce similar compulsory planting, the Cultivation System (*Kultuurstelsel* in Dutch), which was also criticized by the islanders on Java. Tthat was happening even though the policy makers of the Dutch and Satsuma governments had no apparent direct exchange. It is very interesting that both of these policies should have been respectively carried out contemporaneously.

The total volume of raw sugar (cured sugar which contains molasses) and unrefined brown sugar (non-centrifuged sugar) produced on Tokunoshima has been about 30,000 tons per year in recent years. That accounts for 39% of the gross production of Kagoshima

Sugarcane harvesting by a small-sized harvester

Prefecture and is a greater volume than that produced by any other island of the prefecture.

Incidentally, about 800,000 tons of raw sugar is produced in all of Japan per year, 24% of which comes from sugarcane. But Japan's yearly consumption, which is mostly of refined sugar, comes to about 2.5 million tons. From that, we can see the importance of sugarcane production in the agriculture on Tokunoshima.

From a global perspective, considering the sunshine duration factor, sugarcane is not being produced on Tokunoshima under optimal climatic conditions, even if the typhoon damage factor is overlooked. This is also true for some other islands of the Nansei Islands. Continuous clear weather is needed during the ripening period, which begins a few months before harvest time, in order to raise the sugar content inside the sugarcane. Climatic conditions on Tokunoshima usually do not provide the necessary sunshine duration.

Rainfall was unusually light and skies were generally clear throughout October and November of 1999 on Tokunoshima. The extraordinarily high sugar content in the sugarcane harvested in that season proves the necessity of sunshine duration.

This year's price of sugarcane actually available to farming households in all the Satsunan Islands is, on average, a little more than 20,700 yen per ton, which is far more than ten times as much selling price as that set by the main sugarcane producing countries of Southeast Asia. But even still, the average gross income per farming household is only about 1.6 million yen per year.

Unlike rice, with sugar, there is absolutely no difference in the taste of the final refined product no matter where the raw sugar was produced. If the selling conditions of a sugarcane producing farm were under completely free competition without governmental subsidization, Tokunoshima would obviously be no match for the Southeast Asian countries, and sugarcane production would have to be discontinued. So the islanders are now examining a diversity of possibilities which might enable them to continue their farming economy somehow without depending on sugarcane.

As I mentioned earlier, the islanders have been zealous about bullfights since the olden days. They are very interested in cattle and their gross production of beef calves is second to sugarcane.

Calves are shipped from the island within one year after they are born. The number of calves shipped from Tokunoshima is by far the highest of the Amami Islands. Production of sugarcane and calves has always been closely knit because sugarcane leaves can be used as fodder. But in recent years, because of the severe aging of the workforce, more and more farmers have been adopting machinery called harvesters, which makes it much easier to harvest sugarcane. As a

result, the situation is changing.

When a harvester is used to harvest the sugarcane stalks, the leaves can no longer be used as fodder. So more and more islanders are decreasing their area for cultivating sugarcane to make a larger area to produce fodder.

Production of calves occupies a high position in the island's agriculture. But now that the international trade with beef has become almost totally free, a significant increase in production cannot be expected. Furthermore, the aged farmers no longer have the physical strength to easily carry their calves to the auction market. The production of calves on the island cannot continue unless young people work hard at increasing the number of calves. Still worse, I often hear that the fee for renting a harvester is another heavy burden.

Recehtly, potatoes have become conspicuous in the farm fields and in shipments. Shipping of the potatoes from the island begins in late January, at which time the potatoes grown on the mainland islands are not ready to be harvested. According to the islanders, they select a variety that is compatible with the reddish soil zone, which I mentioned earlier, directly beneath the surface.

Tokunoshima potatoes are selling for an especially high price on the market because of their whitish flesh. Potatoes have come right next to calves on the latest statistics for gross produce. However, the yield per area on Tokunoshima is somewhat lower than that of the main potato producing districts of the mainland islands, and it is not known whether the production volume will continue to increase.

I hear that potato production is also closely related to sugarcane cultivation. If potatoes are planted on a field from which sugarcane had been harvested and can no longer be ratooned, there is no need to apply agricultural chemicals to the soil. Another advantage with potatoes is that they can be planted after the typhoon season ends and be harvested one hundred days later.

In the past, all of the material to make Oshima pongees was brought to Tokunoshima and the pongee makers, who were mostly females, would earn a considerable income by piecework. But orders hardly ever come in now, only a scanty number of fish can be caught, and growth of tourism is minimal. So town administrations on the island have gone back to the drawing board to brainstorm new ways to somehow increase the blessings from the soil.

An increased production volume of potatoes in recent years is evident all throughout the Nansei Islands, not only Tokunoshima. For Tokunoshima, potatoes are the crop that is now making the best progress. The administrations are thinking of increasing the scale of crop production that best suits Tokunoshima's frost-free climate. The advantage of potato production on Tokunoshima is

that the harvest is earlier than that of the main competing districts. But the advantage of subtropical fruit production is that this is the only region in Japan that can produce it.

Tankan oranges, especially those from Yaku Island, have become well known in the big cities. They taste more like Valencia oranges than any other citrus fruit produced in Japan. *Tankan* oranges are of high quality and, although strength must be applied, can be peeled with the fingers, which makes them superior to Valencia oranges. It will be necessary to lower the price more to compete on a full scale with the imported Valencia oranges.

Winters are too cold on mainland Kyushu, so the most suitable region in Japan to cultivate tankan oranges to full flavor capacity is the Nansei Islands. The number of farming households cultivating tankan orange trees is increasing, but tankan orange tree cultivation on Tokunoshima is still far from the scale of Amami Oshima Island. As a result of the mild winters on Tokunoshima, tankan oranges have an excellent taste, but on the other hand, some of them do not become completely orange in color.

For many kinds of fruit, from the planting stage to the first harvest, it takes a waiting period of several years, which is an enormous burden on the farmers. For tankan oranges, the wait is three years.

Although tankan orange trees are usually cultivated outdoors on Tokunoshima, other kinds of trees originating in the tropics must be cultivated in a greenhouse. And other kinds can be cultivated outdoors but produce better fruit in a greenhouse. On Tokunoshima, mango trees are representative of the type that are cultivated in a greenhouse.

Mango producer's signboard ©Kazutaka Nakano

Mango production is not limited to Tokunoshima. Mangos are produced in the area from Okinawa Prefecture into mainland Kyushu and the area is gradually expanding. Mango trees are originally from the tropics south of the Tropic of Cancer. But the advantage of cultivating

the trees in Japan is that the mangos can be shipped in their fully ripe condition. As with bananas and other tropical fruit, for many reasons, it is difficult to import mangos into Japan in their fully ripe condition.

Even though the domestically grown mangos are clearly higher priced than the imports, the domestically grown fully ripened mangos are more delicious and more enticing to the eye. Compared to most other people in the world, Japanese tend to attach much more importance to appearance than to other qualities of a fruit. Foreign fruit producers who export to Japan are finding out that their fruit cannot be sold at a good price unless it looks delicious.

It is best for mangos to be grown in greenhouses in Japan for obvious climatic reasons and also because they look more attractive when they are grown indoors. Unlike on mainland Kyushu, on Tokunoshima, there is no need to always go through the trouble of heating up the greenhouses. That advantage more than makes up for the transportation cost to the mainland islands.

Less than 100 farming households are involved in shipping mangos today and the sales turnover is less than one hundred million yen but there is potential for a higher volume of production. The key to success will be to entice potential consumers to pay the high price to try the mangos.

An intended potential sales target is the gift market. Japanese have a custom of selecting rare foods with high prices to give as gifts mostly during mid-year and year-end. The only trouble is that mangos from Tokunoshima are shipped in autumn. It is said that most mangos are presently being shipped by mail in packages that do not pass through the Agricultural Cooperative Association.

A marine product of Tokunoshima that I would like to mention is green laver. When you drive along the seaside road anytime from January to the end of April during the ebb of the flood tide, you notice deep green seaweed covering the rocks. That is green laver, Monostroma. The islanders have been putting it in their soup and eating it since ancient times.

This edible seaweed is found around the islands of Okinawa Prefecture, around Kyushu, around Shikoku, and also around Honshu from the west through the Tokai district. On Tokunoshima, having started with prefectural aid, several companies have been culturing green laver for the past twenty years. More than half of the production volume is dried, pressed into sheets, and shipped mostly to the other islands of the Nansei Islands. Most of it is ingested in the traditional way, which is in soup. The exquisite aroma is out of this world.

The green laver cultured around mainland Kyushu is shipped all over Japan in packages as aonori, which is a dried and chopped condiment sprinkled

on rice and noodles. It is also marketed in jars as *tsukudani*, which is a boiled down thick paste. But the production volume from Tokunoshima is too little to be shipped throughout Japan. A representative of the island's top green laver company told me that a great increase in production volume is not realistic because an enormous investment would be required.

Green laver, natural (foreground) and cultured (background) ©Kazutaka Nakano

erial view of Wadomari Town ©Wadomari Town Office

Chapter 9

People who Bet on the Erabu Lily

Okinoerabu

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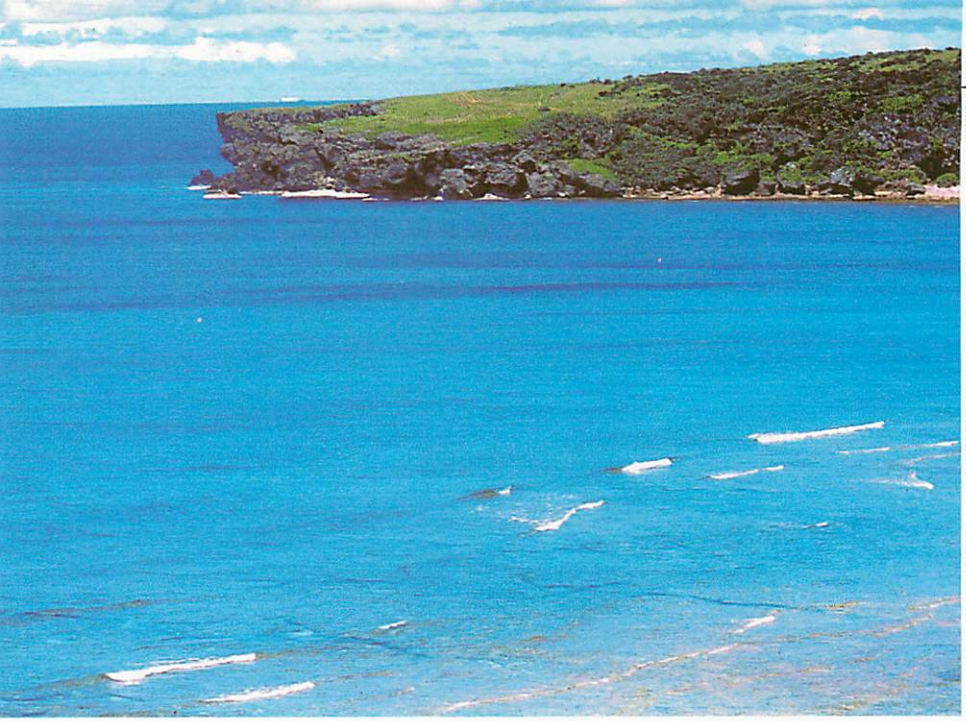

The shore facing the northwest. Bizarre coral reef rocks eroded by waves stretch endlessly. Here and there among the rocks, there are openings from which seawater spouts up as high as ten meters. Easter lilies grow wildly on coral reef cliffs like this and throughout widespread grasslands nearby. ©Wadomari Town Office

Okinoerabu Island, 542 kilometers south of Kagoshima City, is a relatively small island with a circumference of about 50 kilometers and an area of about 95 square kilometers. Most of it is uplifted coral reef. The island has a 250-meter high mountain that is surrounded by karst topography interspersed with numerous peculiar dolines (sinkholes). The dolines lead to a network of limestone caves where precious rainwater accumulates. The accumulated rainwater flows through the caves and gushes out at the seaside, providing the islanders with drinking water and agricultural water, and drains into the sea of moderately developed coral reefs.

This inconspicuous island has become one of Japan's prominent self-sustaining islands. For about a century here the islanders, enduring sterile soil, with lily in hand, have been staging a dramatic show of island vitalization. The lilies here are Erabu lilies, which flutter in the northwest winds.

Islander Spirit Fostered by Takamori Saigo

In 1266, Okinoerabu entered a 340-year period of rule by the Ryukyu Kingdom. And in 1609, it went under rule by the Satsuma Domain a fter the Shimazu Clan conquered the Ryukyu Kingdom. For almost 260 years until 1871 when the prefectures of today replaced the feudal domains, Okinoerabu endured the torture of the Shimazu Clan's merciless colonial policy. The clan conducted malicious and merciless administrative reforms that drove the islanders into what they call "Sugar Hell." The episode in history is still talked about on the island today.

During that time though, an important incident took place. In 1862, Takamori Saigo was exiled to Okino erabu after he angered Hisamitsu Shimazu, the feudal lord of the Satsuma Domain. His sentence was only two years, but during that time he taught systematized knowledge and politics to the young people on the island and implanted morality and ethics into their minds. Doing so, he indirectly helped foster the islanders' desire to be self-sustaining.

Masateru Tsuchimochi (born in 1834) was the chief of police when Takamori Saigo was imprisoned on the island. Later, in 1864, he became the head of the town. Tsuchimochi transferred Saigo from jail to a confinement room, looked after him, and spent much time with him. Tsuchimochi realized that the islanders would need systematic knowledge in order to make Okinoerabu into a great island.

He considered the peculiar kind of systematic knowledge taught in the Satsuma Domain to be ideal. So, holding Saigo in high esteem, Tsuchimochi cordially asked him to become the teacher of the children on the island. Saigo readily accepted. He conducted the peculiar Satsuma type of education with more than twenty boys and implanted a vision of the island's future in their hearts before he left the island.

Okinoerabu was hit with frequent typhoons and a period of drought during Saigo's sentence. Seeing the rough time the islanders were going through, Saigo instructed Tsuchimochi in details of a granary system that was used for avoiding famine in China during t he Sung Dynasty. Under the granary system, during years of average harvest, the islanders were ordered to supply to the granary a certain amount of rice, wheat, millet and other grains, and during years of famine, grain was loaned out to them at a low rate of interest.

The granary system was put into operation in 1870 by Tsuchimochi himself and continued until 1899 when a steamship made it possible to transport large amounts of cargo to the Amami Islands. During that time, the islanders

became diligent and thrifty and developed a propensity to save. This disposition is still characteristic of the islanders today.

One of the boys who received education from Takamori Saigo was Tankei Misao, who was born in 1847. In 1887, he became the village official (the village chief of today) of Chi-na (pronounced "chee-nuh") and seventeen other villages.

In 1908, when a new municipality organization was put into effect, he was appointed village chief of Chi-na. (In the new municipality organization, Okinoerabu was made to consist of two villages, Chi-na and Wadomari.)

Misao was deeply impressed with Saigo's words, "Only casting out greed leads to a harmonious society." And with that motto, Misao conducted many projects involving harbors, irrigation, road improvement, and so on at his own expense. He made sure that the elementary school was well equipped, he gave farewell presents to graduating pupils who had no family or relatives, and he provided lodging for higher elementary school pupils commuting from distant places. It is worth mentioning that Misao used to invite elderly persons to his house and celebrate their longevity. It is said that this was the origin of the island's respect-for-age association.

When they were local administration leaders, both Masateru Tsuchimochi and Tankei Misao expressed the concept of "island revitalization," which took deep root in the islanders' hearts. The concept was to lead Okinoerabu into its self-sustaining condition.

The Erabu Lily

Easter lilies (*Lilium longiflorum*) grow wild in a wide area from Yaku Island down to the Yaeyama Islands of Okinawa Prefecture. They are very adaptable to a wide range of natural environments. On islands of Paleozoic strata, the lilies flourish on hilly lands and on sea cliffs lapped by seawater. And on islands of uplifted coral reef, they germinate and burst into bloom on the grasslands of the seashores and on precipices where no other plants can grow.

These lilies were introduced to Europe through the World Expositions from 1870 through 1980 where the cleanliness of the lilies' pure white petals won showers of praises. As a symbol of purity, the lilies came to be used in great quantities for Christian events and later became known as "Easter lilies."

That is how export of Easter lily bulbs to the Occident began. But it was actually the Easter lily merchant, Isaac Banting, who encouraged the islanders to cultivate lily bulbs as a cash crop for export instead of sugarcane when he came ashore after encountering a disaster

at sea in 1899.

With the travails of World War I, virus contamination problems, overproduction, lily trade cooperation internal strife and World War II, the Easter lily industry traveled a bumpy road. But production and export of the bulbs has continued and is still continuing without interruption.

The natural flowering periods of the Easter lily are the last ten days of March in the southern islands of Okinawa Prefecture, from the early part to the late part of April on Okinoerabu, and in the middle ten days of June in the Tokyo area. In Japan, the price is driven down by a profusion of cut flowers that hits the markets during those periods. So the islanders want to ship cut flowers when the unit price is high from November through March.

To make flowers bloom in winter, a special cultivation technique called "forcing" must be applied from spring through summer. To force lilies, rich bulbs must be obtained as early as possible, treated with low temperature and then planted. In the Occident too, lily bulbs are obtained early for forcing in order to produce the necessary flowers for Easter

July 1964, the 610-ton cargo and passenger vessel Akebono Maru was able to come alongside the pier of Wadomari Port for the first time. That ended the inconvenience of using a barge for loading and unloading cargo. Later, 1,500-ton ships in 1970 and 6,000-ton ships in 1974 also were able to come alongside the pier. The shipping of bulbs (inset) improved dramatically.

festivities in April.

The annual mean temperature on Okinoerabu is 22 degrees Celsius. The mean temperature in winter from December until March of the following year is a warm 17 degrees Celsius. The suitable temperature for growing Easter lilies ranges from 15 to 25 degrees Celsius, hence Okinoerabu's climate is especially good for lily production. This gives the island at least a one-month head start over any other place in harvesting early bulbs.

Moreover, firm rich bulbs can be produced in the island's heavily clayey soil, which is weathered by uplifted coral reef. In this way, bulbs produced on Okinoerabu are unrivaled and have won acclaim as optimal for forced flower cultivation. A great amount of technical knowledge and effort has been mustered from home and abroad for early harvesting and shipping of rich bulbs.

With backing from the town and prefectural administrations, the islanders have established a system of production and shipping. The system involves aspects such as shipping adjustments and rationalization of transport. It also involves the production of virus-free bulbs demanded by the countries in the Occident. And it involves artificially improving breeds of lilies brought in from other areas to produce more suitable strains for export. For example, high acclaim has been won for executing scale propagation using the mother block system to produce healthy bulbs and for bringing in breeds such as *hinomoto* (*Longiflorum Hyb.*) and Georgia.

Fully equipped port of Wadomari and surrounding fields for producing bulbs and cut flowers. Wadomari is 62% tillable land, which is an extremely high percentage. Of that, 71% is prepared farmland. ©Wadomari Town Office

Lily cultivation for bulb production is conducted in infertile red earth with dead sugarcane leaves plowed into it. Such conditions produce firm bulbs. ©Keiichiro Tashiro

The harvest period for bulbs on Okinoerabu is the one-month period from early June to early July. Bulbs don't germinate if they are harvested earlier. After the old stems and leaves are cut off, the bulbs are put into a container one at a time. Together with the container, the harvested bulbs are dipped into bactericide and carried into the collection place. © Wadomari Town Office

From Bulb to Flower and Vegetable

Production of cut flowers in the town of Wadomari began in around 1973. At that time in Japan, production costs were rapidly rising in all industries as a result of surging oil prices. Using that as an opportunity, the islanders thought it would be a good idea to take advantage of the island's temperate subtropical climate and produce cut flowers on the island. In those days, the quality of the Easter lily bulbs had severely deteriorated as a result of being repeatedly cultivated on the same fields every year. Many were rotting and many were infected with viral disease.

Moreover, the countries in the Occident were starting to produce their own Easter lilies and what little was still exported from Okinoerabu was limited to the extra lilies needed at Easter time. So the volume for export dropped drastically and monetary income dropped accordingly.

In that milieu, the most ferocious typhoon ever recorded in history rampaged through Okinoerabu in September 1977. With a maximum gusting wind

velocity of over 80 meters per second and atmospheric pressure of 907 hectopascals, the typhoon destroyed eighty percent of the approximately five thousand houses on the island. The islanders had to shoulder a 9.8 trillion-yen loan for the restoration for their houses alone.

It was that typhoon damage that directly hastened the switchover in production from mainly bulbs to cut flowers. Cut flower production was more profitable than bulb production, so numerous farmers started producing cut flowers to get money to recover from the typhoon damage. Another factor that hastened the production switchover was rapid internationalization. Moreover, export of lily bulbs was hit hard by the Plaza Accord of 1985, which brought on rapid appreciation of the yen and rapid opening of the market for agricultural products. As a result, the production of Easter lily bulbs diminished slowly but surely.

Flower cultivation on Okinoerabu began in the Meiji Era (1868-1912) with the Easter lily bulbs that grew wild on the island. Lily bulbs and sugarcane were produced along with other crops in the island's agriculture from the end of World War II through the 1960s. In the 1970s, production of lily bulbs and sugarcane went full-scale. Paddy rice production diminished dramatically as the paddies were mostly all converted into farmland.

In the 1980s, the switchover from lily bulbs and sugarcane to cut flowers and vegetable production began. Gladioli were the main cut flowers produced. Potatoes and taro were the main vegetables produced. Entering the 1990s, the production of cut flowers greatly escalated and chrysanthemums, lilies, goldenrods and other flowers were added to the line. But production of cut flowers brought about a major change in the way the tillable land was used.

Bulbs and sugarcane had been cultivated in the open field, but flowers are cultivated inside greenhouses. The switchover in the beginning of the 1980s from outdoor to indoor cultivation brought an end to crop rotation. The farmers erected greenhouses and started growing the same flowers in the same area, year after year, which is called serial cultivation. As a result, Okinoerabu later came up against an extremely troublesome problem involving environmental safeguard.

Environmental Pollution Ordeal

Scientists at Mie University analyzed the nitrate nitrogen and agricultural chemicals in the water sources of Okinoerabu. According to the university's report in 1994, water sources in forest ar-

eas had almost zero nitrogen concentration and posed no problem. But in water sources surrounded by farmland, the concentration was mostly from 2 to 3 ppm, and over 6 ppm in some cases.

With well water and spring water, the concentration surpassed the environmental standards maximum allowable value of 10 ppm at eight locations, and was between 5 and 10 ppm at twenty locations. The islanders were cautioned that the chemical fertilizer they used on their farm fields was causing the high concentration of nitrate nitrogen accumulation.

Water is no longer taken from water sources with high concentration levels. But if farmland increases and more greenhouses come into use, the water contamination will most likely become more severe in the near future. In an examination of agricultural chemicals in underground water, at least 0.1 ppb and a maximum of 3.3 ppb were detected at 9 out of 34 locations and in 9 out of 13 specimens of water draining into a sewer or the ocean. Coming closer and closer to the 5 ppb maximum established as the safety standard for tap water, the islanders must judge how safe their situation is.

The amount of agricultural chemicals used in tillable areas in the town of Wadomari is 63 kilograms per hectare, which is about the same as the national level. But tillable land occupies 47% of the island, which means 31 kilograms of agricultural chemicals are used per hectare on the average for the total island surface. That figure is 2.6 times the national usage level.

The figure is no big surprise though. For cultivating flowers, almost ten times the amount of agricultural chemicals used for cultivating sugarcane is generally used. For example, for general pesticide spraying, bactericides such as Captan are diluted with one thousand to two thousand times the amount of water before they are used. But when dipping bulbs or seed potatoes into agricultural chemicals to destroy the bacteria, a rather high concentration is used. The agricultural chemicals are diluted into only one hundred times the amount of water.

Still worse, the chemical solution gets dirty after a few bulbs or seed potatoes smeared with red earth are dipped into it. So the solution must then be thrown away somewhere in the field or into the sewer or onto the roadside. Flowers are also heavily exposed to agricultural chemicals. Being nonfood products, they are subject to frequent sprayings.

The large amounts of chemical fertilizers and agricultural chemicals thrown into the fields are penetrating into the underground water. And the agricultural chemicals cast into the sewer are flowing directly into the sea. This vicious cycle is defiling the island and the sea and is adversely affecting the health of the islanders and the living organisms in the sea.

The Wadomari town administration is making great efforts to prevent environmental pollution. In 1994, they worked

out a policy to reduce 20% of chemical fertilizers and agricultural chemicals thrown into the fields by 2000. In 1996, they constructed the Agricultural Liquid Waste Disposal Facility. In 1997, they constructed the Erabu Compost Center. And in 1999, they constructed the Waste Vinyl Disposal Facility.

Such administrative action is very helpful. However, it is a fact that even if organic fertilizer is increased to the degree that chemical fertilizer is decreased, there will still be no decrease in the total amount of nitrogen put into the ground. How will the administration admit to and deal with facts like that?

Production and Distribution of Cut Flowers

Right from the beginning, Okinoerabu has been an island that naturally produced lily bulbs. Cultivation of the wild lilies began at the end of the Meiji Era and about a hundred years has now passed. After World War II in 1949, the Erabu Lily Bulb Shipping Cooperation was established on the island to handle the lily bulbs. Production of freesia bulbs later began so the cooperation was renamed "Erabu Freesia & Lily Bulb Shipping Cooperation."

Production of cut flowers began in the town of Wadomari in the mid-1970s and the Erabu Ornamental Horticulture Association was established in 1981 to handle the shipping of the cut flowers. At the same time, association members started producing cut flowers at the Wadomari Agricultural Cooperative (now called "JA Wadomari") and shipping was also handled there. So it came to be that Wadomari had two organizations that shipped cut flowers.

The islanders thought it best to unify the two shipping organizations, and thus the Okinoerabu Flower Distribution Center was established in 1990. The distribution center started collecting the cut flowers from the farms of Wadomari and shipping them to markets throughout Japan. A steady increase in the sales turnover was expected and the distribution center was expected to grow accordingly.

The sales turnover increased indeed. The 3.15 billion yen sales turnover of 1996 was 1.7 times that of the 1.85 billion yen of 1990. But the sales turnover of cut flowers shipped directly to the market by individuals had skyrocketed from the usual 34 million yen per year until 1991 to 600 million yen in 1996. Moreover, JA Wadomari restarted independent collecting and shipping of cut flowers in the same year, 1996.

When the Okinoerabu Flower Distribution Center was just established,

it handled 98% of the sales for cut flowers, but the percentage plummeted to 76% by 1996. So now three shipping systems for cut flowers exist in the one town. That phenomenon is unique to Okinoerabu.

The Okinoerabu Flower Distribution Center is the base for the gathering and dissemination of information about cut flower production. With its booking system, it can systematically ship to over 130 markets throughout Japan. The farmers who produce cut flowers readily acknowledge that the distribution center is the principal organization for everything from production to sales and is performing an important function in making the island a well-known place for producing cut flowers.

Easter lilies in full bloom in a town-run experimental farm on Okinoerabu. The aims of the farm are to supply superior seedlings of lilies and other flowers and to popularize superior strains. At the same time, it also fosters a skilled work force by providing training for cultivation techniques and guidance for business managemen ©Wadomari Town Officet

But the distribution center doesn't always set a retail price that justly reflects the difference in cultivation techniques used by the individual farmers or the amount of energy the farmers invest. And sometimes the farmers can get a higher retail price established through JA Wadomari or by marketing their products themselves. The farmers also feel that the shipping costs charged by the distribution center are a bit steep. Such factors are most likely dampening the independent minded farmers' will to work and are increasingly driving them away from using the distribution center.

Aerial view of Yoron Island ©Kihachiro Kaneko

Chapter 10

Yoron Health Villa

Yoron Island

Seiji Kokawa

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Yoron Island, the southernmost island of the Satsunan Islands, has a population of about 6,000 and an area of 20.49 square kilometers. The entire island forms the town of Yoron. The islanders there refer to their island as "Yunnu."

Yoron is a flat island made of uplifted coral reef. Viewed from the sky, it is an angelfish-shaped island surrounded by growths of coral reef. Yoron is extolled as "a dazzling pearl afloat the Pacific seas." Until Okinawa was returned to Japan, Yoron was popularly known as Japan's southernmost island. About eighty thousand tourists a year come to see its pure white sandy beaches and emerald green waters. Yoron is being developed as a resort island. In fact, the islanders declared that their island is the Panauru Kingdom, which means "kingdom of flowers and corals," and entered a sister pact with Mykonos Island of Greece.

The first time I visited Yoron was twenty years ago when the island was in the limelight as a sightseeing spot. The scenery was exactly the image that most Japanese have of an island in the south Pacific and I was able to experience the total sensation of the southern island. In those days, not many facilities had been set up for sightseeing on the island. Young people thronged the island just for the beautiful ocean.

Tourism is still an important industry of the island today. The islanders are making a diversity of endeavors to promote tourism that meets the needs of the tourist. For example, tourism on the island used to be focussed on summer but they are expanding the scope to encompass the whole year. They are creating a townscape and scenery that befits the island's tourism and are conducting publicity campaigns to attract more visitors.

Last year, I visited Yoron again and had the opportunity to meet medical practitioner Dr. Seiji Kokawa. At that time, I learned more about a group of non-governmental facilities called the Yoron Health Villa. The facilities operate jointly with the objective of using the climate and natural environment of Yoron for promoting health. I have asked Dr. Kokawa to introduce the details of regional revitalization through the activities of the Yoron Health Villa in this chapter.

The Yoron Health Villa conducts a great diversity of activities for regional development but activities involving medical services and attention to primary health care are especially unique features (Primary health care is the prevention of sickness in people through health improvement, inoculation, improved environmental sanitation, and so on.).

Yoron was still as beautiful as it was twenty years ago. I was impressed with the degree of regional development and vitality of the Yoron Health Villa members. According to data for the Yoron Town Development Plan, the service industry is the industry with the highest net production ratio in the town of Yoron. It is followed by construction, agriculture, wholesale &

Aerial view of Yoron Island ©Kihachiro Kaneko

retail business and banking & insurance.

About one third of the population of six thousand is concentrated in the Chabana area. The Higashi and Nama areas each form a medium-scale community. And the other areas form small-scale communities throughout the whole island. The population of every community has been decreasing in recent years. Uniform development throughout the entire island is considered the main challenge facing Yoron.

The 4th Ten Year Plan of Yoron has been mapped out as a specific plan that shows the direction that the town of Yoron should take for the ten-year period starting in 2001. The plan also indicates the goals and the way to reach the goals. It has been decided that the officials and the civilians will unite to execute the plan with the underlying concept of "unique island development with radiant people and natural environment." (Shinichi Noda)

Regional Revitalizaton Activities

The effect of the bubble economy was deeply felt even in this distant remote southern island of Kagoshima Prefecture. Its vestiges can be seen in the shutdown

stores in the shopping districts, in the closed down inns interspersed throughout the island, and in Yurigahama where the modern buildings were erected but ultimately found no use. The scenery is like the peaceful field after a gruesome battle.

I was stunned to hear that the price of land went for 700,000 yen per *tsubo* (3.306 square meters) on the shopping street called Chabana-Ginza Street. That is an astronomical price for land on a remote island. After the bursting of the bubble, like in the rest of Japan, the unsupported load of Japanese economy pressed the island administration down into deficit.

Everyone on the island is wondering what happened to the money that the overflow of tourists used to bring to the island. And still worse, with an aging society and a decreasing birthrate, the island population is gradually diminishing, and everyone on the island is now feeling uneasy about the future.

But a new trend is gradually emerging with the changing times. The new trend is not the conventional approach that is apt to become a plan aiming for government-subsidized regional revitalization centered on some public utility. It is a trend in which the local inhabitants themselves develop the region with their own abilities in their own unique ways. The trend is changing the direction of our lifestyles and can be considered a blessing brought on by the new era.

Examples of the trend are the Yoron Health Villa, the Yoron Folk Villa and the Yoron Greek Villa. The Yoron Health Villa aims to actualize our conception of an island that promotes health through Yoron's environmental characteristics as an island. The Yoron Folk Villa aims to create a community that breathes life into Yoron's traditional products, history, language and so on. And the Yoron Greek Villa aims to deepen Yoron's relationship with Mykonos, which is Yoron's sister island in Greece, through human communication and substantial exchanges of culture and products, and create a Greek atmosphere. In addition, the regional women's bureau, 4-H club, cross-industrial association and other groups are also actively involved in the trend.

Trying to put order to all of the separate activities, the members on the front line have held frequent meetings to review the citizen-based town planning with the ten-year regional development plan. In addition to four conferences requested from the regular town authorities, extra meetings were held almost every week from eight o'clock in the evening to midnight for more thorough discussions. The plan received approval of the Yoron town assembly and has become official. I will present a synopsis of the results at the end of this chapter.

It is an often repeated claim, but through the many review meetings, I became even more convinced that regional revitalization is brought on by the people of the region. Having accepted the role of the responsible person, I was surprised that so many people in Yoron had become ac-

tive in the regional revitalization and I am deeply grateful for the very favorable situation. Regional revitalization is not something that comes from Tokyo or some other place. It comes from the people living in the region.

Concept of Yoron Health Villa

In a turn of fortune's wheel, in 1988, I was assigned to the Yoron Town Municipal Clinic. I call myself a primary care doctor who practices medical treatment for the whole person. As the characteristics of the region are important elements of primary care, a remote island like Yoron is the ideal location for my practice because it is a clear-cut medical care zone.

The culture and customs on Yoron are unique. Although Yoron is part of Kagoshima Prefecture, it is five hundred kilometers away from the prefectural government offices. And due to its geographic position, it has received long years of influence by the Ryukyu dynasty. Moreover, although much of its natural environment has been destroyed, its splendid scenery has never stopped enchanting its numerous visitors.

Conducting medical treatment on Yoron convinced me that the essence of sickness is in the daily life, climate and surroundings of the sick person, and for many people, the atmosphere of a peculiar region has a healing effect. Although Yoron has a modest population of only six thousand-odd people, a hundred and twenty of them are oldsters over ninety years old, many of whom are still actively working.

The Remote Islands Development Division of the Regional Development Bureau of the National Land Agency gave the name "island therapy" to health building through utilization of an island's peculiar characteristics. It defines the characteristics of island therapy as follows:

1) Being isolated, small and separated by an expanse of ocean, the island provides an unordinary environment that is different from urban living environments. The island's environment befits health recuperation and is ideal for a change of air and scenery.
2) An abundance of lush natural environment remains on the island and development can be expected for marine activities and recreation such as leisure walks, hiking, cycling and sea bathing.
3) A unique culture has developed on the island since ancient times and a kind of traditional human relationship and exchange that the urbanites are on the verge of forget ting still thrives on Yoron today. A stay on the island fosters a healthy spirit and heals a tired mind.

4) The marine and agricultural products of the island are healthy foods.
5) Being an island surrounded by beautiful ocean, its atmosphere provides a thalassotherapeutic effect anywhere.

Considering size, shape, climate and culture, Yoron is indeed the ideal place for island therapy.

I had already been picturing the concept of the Yoron Health Villa in my mind before I was assigned to the Yoron Town Municipal Clinic. At that time, the Yoron Pricia Resort also had ideas about becoming a place for health recuperation and made a request to me for cooperation with the medical treatment aspects of their plan. I consented. However, for some reason, their activities for such health recuperation came to an end.

But the idea never left me. I had actually started activities for the Yoron Health Villa before the announcement of the island therapy concept so I heartily agreed with the concept when it was announced. I put the existing facilities into action and decided to focus on tourism for medical treatment in a wide-ranging way.

The World Health Organization defines health as the state of physical, mental and social well-being, but I would like to add the state of spiritual well-being, which I mentioned earlier. I believe that a good spiritual state is the state in which you are earnestly seeking the life goal that was meant for you. At the Yoron Health Villa, we want to promote activities aiming to foster such a healthy state.

Activities of Yoron Health Villa

The Yoron Health Villa officially opened in 1995. As I mentioned earlier, I had been thinking of the plan for ten years, but it was only after I moved my Panauru Clinic to the natural environment of the Nama area that I began substantial activities.

At that time, the person who leased the land to me had been developing his idea of producing healthy food and tropical fruit using organic farming and just started harvesting the tropical fruit. He launched the Shalon Farm, joined the Yoron Health Villa, and became the nucleus of the group's food and health operations, which include hortitherapy.

The newly constructed Panauru Clinic is a total timber construction using large processed cross sections. I gave it an original structure in which space for building health occupies half of the facility.

Having made the medical science of primary health care the mainstay of the clinic, I decided to establish day clinics for the elderly. I also decided to regularly hold

exercise programs for health, conducting exercises such as walking, stretching and rhythmic movements. And considering the severity of environmental effects on the health, I decided to hold forums twice a year with the theme of environmental effects on the health. I also worked on cultivating kenafs, which are said to be gentle on the environment.

Exactly when I arrived to Yoron, a man who had been requested to come up with specialty products succeeded in developing a cuisine of buckwheat noodles in soup with an alga-like seaweed called *mozuku* (*Nemacystus decipiens*) and marketed it as health food. He also worked on salt making, which had been an ongoing task, and came up with natural salt with the brand name "Jinen." The natural salt and traditional millet vinegar with the brand name "Ougonsu" have come to play an important role in the Yoron Health Villa.

I also decided to get the cooperation of the Yoron Village Resort, Rakuen Inn and the Yoron Pricia Resort, which are nearby, as lodging facilities to accommodate people coming to recuperate for a long period. In addition, as ceramic art workshops, along with Gallery Kai, a Yoron-yaki *kamamoto* pottery workshop, a Yunnu *adouru-yaki* pottery workshop and a handicraft workshop have joined the Yoron Health Villa. And as an easy-going meeting place, a restaurant-tavern called "Hyoukin" has also joined.

I have drawn up simple statutes, which are the business operation rules. In the statutes, Yoron Health Villa is defined as a group of independent enterprises that operate jointly and aim for total health building. The annual dues are five thousand yen for proprietors and one thousand yen for general members. For details, visit the Yoron Health Villa website *http://www.yoron.or.jp*

An organization of this form had never been established on Yoron before, so when I registered the Yoron Health Villa in the Yoron Tourism Cooperation, the other organizations couldn't understand what the villa was about. However, the number of people coming for long periods of recuperation has been increasing in winter lately so they are finally starting to understand that the Yoron Health Villa is contributing to tourism after all.

The regular monthly walk meet started by the Yoron Health Villa has now evolved into the Yoron Walkers Society with an office at the Yoron Tourism Cooperation. The walking course circles the island. It is divided into five segments, each with a different name. I have had pamphlets made that teach anyone how to walk the course throughout the year. Every November, the Yoron Panauru Walk attracts over two hundred participants from all over Japan every year. This year's meet will be the tenth.

Traditional thin and middle-sized samisens are a vital part of the lifestyle on Yoron. Until recently, men and women of the island used to form relationships through musical exchanges using the

samisens. It used to be common on moonlit nights for a man to be plucking away on his samisen as he approached the home of a woman he liked. Upon hearing the sound of the samisen, the woman, waiting eagerly, would go out to meet the man and accompany him on a visit to the beach.

I hold samisen workshops using Yoron's traditional samisens as tools for healing. Most people can learn one or two numbers during a one-month stay. The workshops also serve as a means to keep the tradition alive by having the children of the island also participate.

I am now introducing some Yoron Health Villa houses that I had constructed for people who move to the island to reside permanently. The presence of new permanent residents will add to the regional revitalization and increase cultural exchanges. And the increase in population will naturally add liveliness to the region.

It is a peculiar example but I happened to meet a Buddhist priest of the Nichiren sect who wanted to propagate Buddhism on Yoron, which has never been subjected to Buddhist propagation. He also decided to move into the island. I listen to his sermons about care of the mind and heart from time to time.

For regional exchange, I started an exchange program with the town of Niikappu in Hokkaido. In the program, elementary school pupils of Yoron and Niikappu change places. For starters, from January 1st to the 7th last year in 2000, I took four Yoron pupils to Niikappu to experience the Hokkaido winter. The Yoron children stayed at the homes of pupils of Taiyo Elementary School and gained very valuable experiences, seeing the dairy farms, going skiing, and so on.

And at the end of July, eight pupils from Niikappu came to Yoron to experience the summer here. Unfortunately, a typhoon struck the island just after the pupils arrived but they were still able to enjoy swimming in the ocean during the calm intervals. And this year in January, three Yoron pupils went to Hokkaido. The money for the trip is partially supplied by the pupils themselves, but most of it comes from bazaars and donations.

A little while ago, on the Yoron Health Villa website, which was established a few years ago, I started a mailing list to enable people inside and outside the island to participate. About a hundred people have already joined through the mailing list and a lively exchange of all sorts of information is taking place. This new network is opening even more doors.

The Internet has done away with the obstacles of time and distance so regular exchange can now be made with the USA, Hong Kong, India, or anyplace else around the globe, not to mention Japan. Online members who visit the island get to actually meet some of the people they had been communicating with via the Internet.

As a new operation, the Yoron Health Villa is recruiting helping hands to harvest millet and has started an exchange between farming households and young men from

Yoron Panauru Walk ©Seiji Kokawa

Panauru Clinic, where the office for Yoron Health Villa is located ©Shinichi Noda

big cities. This year five young men were selected from fifteen applicants. They all tackled the work in high gear and earned an excellent reputation.

As a recent experiment, to make use of natural energy, a so-called hybrid type of generator powered by both sunlight and wind has been under installation on the site of the Pricia Resort. I would like the Yoron Health Villa to continue aiming to promote Yoron's image as the ideal place for overall health building. Yoron's image should be that of an island of clean energy that is gentle to the environment, an island that supplies healthy food, and an island that places high priority on health and the environment.

Health exercise room inside Panauru Clinic ©Seiji Kokawa

Future Prospects

Based on the 4th Ten Year Plan of Yoron, which I outlined earlier, I would like to introduce the future prospects for here on as part of Yoron's plans for the future. The direction for the Yoron Health Villa to take is incorporated in the plan.

The main underlying concept is unique island development. Unique island development means development that turns Yoron into a place with the special feature of having that which is only found on

Yoron and that which can only be done on Yoron. It also turns Yoron into a place to take pride in and a place that is second to no other region. To bring out Yoron's unique atmosphere, we must have a solid understanding of the natural resources and culture of the region and bring in new aspects while being careful not to destroy traditional aspects.

Here is the basic plan:

1) Developing unique people
2) Developing unique industries
3) Developing a unique town

A region cannot be revitalized without people. From here on, the personnel to revitalize the region must be trained. Not to mention the often-talked about "outsiders, zealots and youth," a good balance of personnel is needed for overall development. (It is often said that outsiders, zealots and youth are vital for successful regional development. Outsiders see opportunities that local people are prone to overlook. Zealots put their hearts and souls into the task. And youth have vigor. Moreover, none of the three types harbor fear of failure.)

I have adopted the following themes as the specific project:

1) To create the think tanks that sustain the island, a Yunnu citizen-based town-planning college will be established and a citizen-based town-planning committee will be formed. For the town-planning college, one year will be set for preparing an official office and curriculum. Graduation will be in one-year units. After graduating, the graduates will become leaders at the actual sites under development. The town-planning committee will basically consist of the review meeting members along with new qualified persons. The committee will promote the 10-year plan and monitor its progress.
2) As the plan for the construction of the living museum, the following will be promoted:
   - The Yunnu Eco-museum plan,
   - Town-planning for exchange with Greece,
   - The plan to create the "Yoron" brand name,
   - The establishment of a center that supports the development of Yoron specialty products,
   - Operations to make silk abaca cloth a specialty product.

The living museum to be called Yunnu Eco-museum will not be a conventional theme park or a facility that merely preserves items of interest. It will be an actually functioning institution that lets the visitors experience Yoron's culture and tradition. The content of exchange with Greece will be deepened both personally and commercially. Products unique to Yoron are still too few so the people involved will put in a united effort and developing more of them. And for that, a center open 24 hours a day will be established. Abaca cloth, which has a long history, will

be further developed as a new textile combined with silk. Through that, the know-how for producing abaca cloth and Oshima pongees will not be forgotten.

3) As the plan to create an island of information, the following will be promoted:
- Preparation and maintenance of an information infrastructure,
- Education involving the retrieval and release of information,
- The bringing about of a software industry.

Aid from the Ministry of Posts and Telecommunications has already been approved for these operations. Revolving around Yoron Junior High School, information education that makes full use of the Internet has begun. The Yoron concept through broadband utilizing ASDL and fiber optic cable has also begun.

4) As the plan for Yunnu intermin glement exchange, operations will unfold for the following:
- Economic exchange with Greece,
- Yunnu cultural exchange,
- Health building exchange.

We are already receiving a great deal of support from JETRO (Japan External Trade Organization) for the economic exchange.

5) To create an island with a favorable environment, the following will be promoted:
- Mapping out of the general plan for environment,
- Adoption and utilization of new energy sources,
- Yoron's ocean regeneration project,
- Environmental studies.

While environmental disruption is a global problem, for Yoron, it is also a local problem concerning the way to protect the natural environment. The hope that the beautiful ocean of Yoron will be preserved forever is harbored not only by the islanders, but also by the many Yoron partisans throughout Japan. I began a reef check as an examination into the state of the ocean water around Yoron. I plan to gather the data from the checks for the coming ten years. The installation program for a wind energy conversion system for natural energy use is progressing well.

Officials and civilians will unite to execute the projects. When Yoron becomes an island that anyone would like to live on, and when it becomes an island that the islanders take pride in, it will truly be a dazzling pearl afloat the Pacific seas. On behalf of the Yoron Health Villa, I would like to further aim to make Yoron a self-sustaining island and to turn the Nama area, which is tentatively named "Nama Valley," into a region of agriculture and IT. I plan to work on promoting the increase of permanent residents and to foster and assemble more personnel from both inside and outside the island. (Seiji Kokawa)

Fact Sheet

Island Groups	Osumi Islands						Toka		
	Misima Islands								
Island	Take-shima	Io-jima	Kuro-shima	Tanega-shima	Yaku-shima	Kuchinoerabu-jima	Kuchino-shima	Nakano-shima	Taira-jima
Administrative division	Mishima-mura	Mishima-mura	Mishima-mura	Nishinoomote-shi Nakatane-cho Minamitane-cho	Kamiyaku-cho Yaku-cho	Kamiyaku-cho	Toshima-mura	Toshima-mura	Toshima-mura
Area (km²)	4.20	11.65	15.37	447.10	504.55	38.04	13.33	34.47	2.08
Circumference (km)	12.8	19.1	20.0	186.1	126.7	49.7	13.3	28.0	4.5
Height above sea level (m)	220	704	622	282	1,935	657	628	979	243
Population (1995)	119	149	245	37,271	13,426	167	177	197	85
Population growth rate	22.7	-13.9	5.2	-4.9	-1.7	1.2	-3.3	-7.9	14.9
Population density (pop./km²)	28.3	12.8	15.9	83.4	26.6	4.4	13.3	5.7	40.9
No. of households	61	77	135	14,692	5,493	90	92	101	41
Population structure by age:									
0-14 yrs	20	17	13	19	19	8	18	13	18
15-64 yrs	61	58	56	59	59	56	50	52	55
65 yrs or over	19	25	31	22	22	36	32	35	27
Employment (%)									
Agriculture	3	3	22	30	16	25	20	1	2
Fisheries	6	8	1	2	3	10	5	7	7
Manufacturing and constructjon	32	30	33	18	25	29	42	31	41
Services	59	59	44	50	56	36	33	61	50
No.of visitors per year	1,800	2,900	3,400	509,100	290,800	–	500	800	400
Distance to Kagoshima City (km)		108		115	135			224	
Connections by sea from Kagoshima City unless described otherwise	2h55m (11/month)	30m from Takeshima (11/month)	1h from Iojima (11/month)	3h30m (1/day)	3h50m (1/day)	1h40m from Yakushima (1/day)	6h (2/week)	45m from Kuchinoshima (2/week)	1h15m from Nakanoshima (2/week)
Connections by sea from other major cities									
Connections by air from Kagoshima City	not available	not available	not available	35m (5/day)	40m (5/day)	not available	not available	not available	not available
Connections by air from other major cities				Osaka					

s (Toshima)				Amami Islands							
se-na	Akusekijima	Kodakarajima	Takarajima	Amamioshima	Kakeromajima	Ukeshima	Yoroshima	Kikaijima	Tokunoshima	Okinoerabujima	Yoronjima
ura	Toshima-mura	Toshima-mura	Toshima-mura	Naze-shi	Setouchi-cho	Setouchi-cho	Setouchi-cho	Kikai-cho	tokunoshima-cho	Wadomari-cho	Yoron-cho
				Kasari-son					Amagi-cho	China-cho	
				Tatsugo-cho					Isen-cho		
				Setouchi-cho							
				Yamato-son							
				Sumiyo-son							
				Uken-son							
6	7.49	1.00	7.14	719.88	77.15	13.70	9.48	56.87	247.91	93.62	20.49
5	8.8	3.2	12.1	461.0	147.5	24.8	18.4	50.0	89.2	55.8	23.7
9	584	103	292	694	326	398	297	204	645	240	97
1	71	48	127	73,643	1,752	249	188	9,268	29,156	15,325	6,210
3	6.0	4.3	-13.6	-4.3	-6.5	-12.3	-13.8	-3.9	-6.6	-4.0	-7.4
6	9.5	48.0	17.8	102.3	22.7	18.2	19.8	163.0	117.6	163.7	303.1
6	42	25	65	28,486	884	125	98	3,738	11,332	5,537	2,004
2	10	23	15	21	10	9	11	18	21	20	22
8	69	56	53	59	43	44	45	53	56	55	55
0	21	21	32	20	37	47	44	29	23	25	23
2	11	24	40	6	15	34	35	28	24	41	31
5	2	3	7	3	20	1	1	1	1	1	2
7	46	21	11	26	24	24	20	24	17	14	19
6	41	52	42	65	41	41	44	47	58	44	48
0	400	400	500	618,800	33,300	500	500	22,500	166,000	39,200	79,000
				380				383	468	546	590
om na ek)	55m from Suwanosejima (2/ week)	1h15m from Akusekijima (2/week))	35m from Kodakarajima (2/week)	11h20m (1/day)	20m from Amamioshima (1/day)	55m from Amamioshima (1/day)	1h45m from Amamioshima via Ukeshima (1/day)	11h10m (5/week)	15h30m (1/day)	17h30m (1/day)	19h40m (1/day)
			3h10m from Amamioshima (2/ month)	37h from Tokyo (1/ week)				1h from Amamioshima (5/week)	34h50m from Kobe (5/month)	37h from Kobe (5/month)	42h30m from Tokyo (2/month)
				31h from Kobe (5/month)					8h30m from Okinawa (1/day)	6h from Okinawa (1/day)	4h from Okinawa (1/day)
				12h40m from Okinawa (1/day)							
le	not available	not available	not available	55m (6/day)	not available	not available	not available	1h15m (2/day)	1h (2/day)	1h30m (3/day)	1h50m (1/day)
				Tokyo, Osaka, Okinawa				20m from Amamioshima (3/day)	30m from Amamioshima (2/day)	30m from Amamioshima (1/day)	40m from Okinawa (2/day)

Source: Nihon no Shima Gaido SIMADAS,1998

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Kagoshima University Research Center for the Pacific Islands

Kagoshima University Research Center for the Pacific Islands (KURCPI) was set up in April 1998 as a cooperative research and educational facility in Kagoshima University. Its predecessor was Kagoshima University Research Center for the South Pacific (KURCSP), which started functioning in 1981. It was later reorganized in 1988 and continued functioning as such until the start of the present KURCPI. At the KURCPI, with the islands and island-zones in the region from the Nansei Islands through Southeast Asia and Oceania as its subjects, research and education is conducted together with researchers inside and outside the organization. The KURCPI publishes the academic journal South Pacific Study as well as other publications and holds workshops, lectures and symposiums. Visit the KURCPI website *http://cpi.sci.kagoshima-u.ac.jp/*