

# **Study Trip Report**

## **Naoshima and Teshima**

**February 10-12, 2012**

## Participants

Master's program students (JDS fellows) at the Graduate School of Life and Environment Sciences, the University of Tsukuba

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## Schedule

	Schedule
<b>Feb 10 (Fri)</b>	06:45 Tsukuba Station
	06:56 Tsukuba-Akihabara-Hamamatsu-cho-Haneda Airport (08:30)
	09:25 Haneda to Takamatsu (ANA533, Arrival time 10:45), to Takamatsu Port (by car)
	12:40 Takamatsu Port to Naoshima (by ferry, 50 min)
	13:50-14:50 Honmura District tour by local guide
	15:00 Naoshima Town Office (interview about sustainable tourism and local industries)
	16:30 Benesse House Museum
<b>Feb 11 (Sat)</b>	09:20 Naoshima to Teshima (by ferry, 20 min)
	10:00-12:30 Industrial waste illegal dumping
	14:00-15:30 Teshima Art Museum and island tour
	15:55 Teshima to Naoshima (by ferry, 20 min)
<b>Feb 12 (Sun)</b>	09:45 From Miyanoura Port to NEC (by bus)
	10:00-10:50 Naoshima Environmental Center (Teshima Waste Intermediate Treatment Plant)
	11:00-11:50 Incinerating & Melting Plant of Recycle Waste (Mitsubishi Material Naoshima Plant)
	13:00-14:00 Chichu Art Museum
	14:20 Naoshima to Takamatsu (by ferry, 60 min)
	17:30 Takamatsu to Haneda (ANA538, Arrival time 18:45)

## I. General information

### 1. Naoshima

- Core island among the 27 islands of Naoshima Town in the Seto Inland sea
- Area: 8.13 km<sup>2</sup>/ coastal line: 16 km
- Population: 3,600 (2003)/ Number of households: 1504 (2011).
- Best known for a contemporary arts display in the Benesse House complex developed by the Benesse Corporation.
- The main industries: metal refineries by Mitsubishi Materials, art tourism (attracting 43,000 visitors per year) by Benesse Corporation, fishing and cultivation of marine products. (Eco-Towns in Japan, 2005)

Figure 1: Map of Naoshima Island



Source: InfoMap Japan.

### 2. Teshima

- Area: 14.6 km<sup>2</sup>/ circumference: 19.8 km
- Population: 1600
- This quiet and beautiful island used to be an "island of wastes" with a major toxic waste scandal in the 1980s when a company illegally dumped around 500,000 tons of toxic industrial waste (<http://www.japan-guide.com>).
- Cleanup efforts had been made by local citizens on Teshima Island for a long time before Kagawa Prefecture recognized that the waste was illegal and toxic.

Now the island has become an ideal place for environmental education on illegal waste dumping and waste processing in Japan.

- Teshima is also making great efforts to revitalize itself to become an attractive destination for contemporary arts.

[By Dang Nguyet Anh]

Figure 2: View from Danyama Mountain in *Teshima Island*



## II. Tourism of Naoshima

Naoshima Island has a beautiful natural landscape such as the sea, the town flower, and the black pine tree which the local residents are very proud of. The island is a favorite visiting site especially for art lovers. Naoshima Island was selected as one of the next 7 wonders to visit in the world in Traveler magazine. A characteristic of Naoshima tourism is clean tourism based on modern artworks and education. The local art scene is very attractive, strange and amazing. The main industries are metal refineries by Mitsubishi Materials, the travel industry and fishing and cultivation of marine products.

According to the town's tentative data, the number of tourists to Naoshima Island has increased ten times compared with 10 years ago. In other words, 46,873 tourists visited in this island in 2002. By 2011, the number of tourists reached 404,485. Majority of the tourists are Japanese. Twenty two percent of the tourists are from the USA, France, South Korea and so on (from handbook "About the effort for vitalizing tourism of *Naoshima* town").

In the 1980s, the town governor Mr. Miyake decided to develop tourism. The governor said that they did not want to develop commercial tourism but clean tourism. Clean tourism means to make basic use of the indigenous resources of history, culture and nature. First, the town asked a travel agency called Fujita Tourism Company, to design and implement tourism in this island. At that time, the president of Fujita tried to follow the

governor's idea, but the first trial of developing clean tourism was not successful. The regulations were too strict to develop tourism. The Fujita tourism company eventually went bankrupt in 1987.

Instead of Fujita, Benesse came into the island to develop tourism. The Benesse is an educational service company based in Okayama Prefecture, which is just north of Naoshima and shares the nature and beauty of the Seto Island Sea with surrounding prefectures. The founder of the company, Mr. Fukutake had wanted to look for the best site to develop an educational park in the Seto area. The Benesse Company was interested in realizing the idea of clean tourism on Naoshima Town.

In 1985, Mr. Fukutake visited this island to meet the town governor. They shared the essential idea of developing clean tourism and discussed how to develop this island. Unfortunately, Mr. Fukutake passed away in 1986, but his son as the second president of Benesse succeeded his father's idea to develop Naoshima as a clean tourism site. In 1987, Benesse gained all the land which was owned by the Fujita Tourism Company on Naoshima Island. Using this land, Benesse, in 1988, released the plan of the Naoshima Culture Village. This was to offer a meeting place for local people and tourists through creative activities like the arts and the education instead of ordinary commercial tourism (from an interview with Mr. Tezuka and Ms. Kumeda, local officers from the Division of Economy and Construction at the Naoshima Town Office).

***Naoshima International Global Camping Site:*** In 1989, Naoshima Town opened the Naoshima International Global Camping Site. Naoshima Town invited local kids and kids from outside the island to exchange communication and to join activities on this island. Within the camping site they provided many kinds of modern arts. That was the first phase of the collaboration with Benesse.

***Benesse House:*** The second phase started in 1992 with the opening of the Benesse House Museum. A lot of modern arts are exhibit in the Benesse House. Tadao Ando, the famous Japanese architect, designed this house. In 1995, the Benesse Annex called Oval was built for accommodation as a hotel.

***Art House Project:*** The third phase of the development was the Art House Project. The Art House Project was initiated by the Benesse Corporation and has used the town of Naoshima as a stage. Artists remodeled an old house in the district of Honmura, transforming the space of each house into an artwork open to the public (Travel Guide of Naoshima). Before this innovation, the old houses were mostly broken and decrepit. Although these houses are very old and very damaged, they have a high historical value.

Figure3: Walking in Honmura District for the Art House Project



**Standard Exhibition:** Another activity by the local people was the Standard Exhibition Vol.1 in 2001. The idea of this exhibition was to spread artworks all over the island. This was important particularly for local people to feel art within the island. There was also Standard Exhibition Vol. 2 in 2006. The Standard Exhibition's artworks can be seen everywhere such as houses, facilities and lanes. Also, the Mitsubishi Material Company provided a place for the art exhibition for Standard Vol. 2. Around 154 art volunteers were involved in this activity, and people from outside the island also participated to support this activity. The number of guests visiting this Standard Exhibition was 10,000 in the first 3 months. The first place for art was Chichu Art Museum. Chichu means "in the ground" (from the handbook "About the effort for vitalizing tourism of Naoshima town").

**Chichu Art Museum:** Chichu Art Museum was established in 2004 as a site to rethink the relationship between nature and people. The museum was built in the earth and managed by the Naoshima Fukutake Art Museum Foundation. It is located on the south side, at one of the highest points of Naoshima. The artworks of Claude Monet, Walter, and James Turrell are installed permanently within the building that Tadao Ando designed (Travel guide of Naoshima).

In terms of business, the economic balance of art activities by Benesse is not successful. It means that Benesse does not want to develop this project as business. The Benesse Company pays some amount of tax to the town office yet at a very low fixed rate. This is because they do not want to gain any profits and thus do not have to pay extra tax.

On the other hand, the Mitsubishi Material Company makes a lot of profit from producing copper and metal materials. They pay a lot of tax to the town office. The town office mostly depends on the Mitsubishi Material Company for its tax revenue. Over 60

percent of the island's population is employed by Mitsubishi Material. In short, Naoshima Town depends on Mitsubishi Material in terms of economy and employment (from an interview with Mr. Tezuka and Ms. Kumeda, local officers from the Division of Economy and Construction at Naoshima Town Office).

In 2010, Naoshima organized the Setouchi International Art Festival. Participants of the festival were not only from Naoshima but also included other islands in the Seto Inland Sea. The number of visitors was 291,000. Although this event was implemented by Kagawa Prefecture as the main organizer, the main sponsor was Benesse Holdings. They are planning to hold the Second International Art Festival in 2013. Benesse have invested not only in artwork but also in employment and building construction and maintenance. Probably they could never get any profits from it, but they want to expand art projects for tourism development activities in this area. Naoshima Town is now assisting Benesse's activities by developing and maintaining the infrastructure as public services involved with the tourism.

Naoshima has a lot of artworks and historical scenery. Naoshima possesses different attractive visiting points like the new art public bath collaborated with arts ("Water Lady"). One of the intangible cultural assets is Naoshima-onna-bunraku. It is a Japanese traditional doll drama. What is the special thing is this doll drama is done by only females, not males.

A lot of tourists are coming to this island, but local people do not prefer and are not interested in making money from the island's attractiveness. Economically speaking, they are much dependent on the Mitsubishi Material, and so they are not interested in developing the tourism business. Although they could do so, the majority of local people are not interested in developing tourism at all, but now they are changing their minds, customizing themselves to meet and support tourists (from an interview with Mr. Tezuka and Ms. Kumeda, local officers from the Division of Economy and Construction at Naoshima Town Office).

The Teshima Art Museum which opened in Teshima Island in October 2010 was created by architect Ryue Nishizawa and artist Rei Naito to meld architecture, artwork, and the environment (Travel Guide of Naoshima).

**[By Munkhuu Undraa]**

### **III. Illegal Waste Problem on Teshima**

#### **3.1 History**

Teshima Island is one of the places which would ultimately bring about one of Japan's worst illegal cases of dumping industrial waste, dating from 1975, when the Teshima Sogo Kanko Kaihatsu Co., Ltd. on Teshima Island applied to Kagawa Prefecture for a permit to

store industrial waste specified as a toxic conductor on the northwestern part of the island and were possessed by the company (GEC 2005).

Residents of the islands strongly opposed and started campaigns against Kagawa Prefecture for permitting this waste disposal. According to the request from the waste operator, the Kagawa prefectural government believed that accepting the waste on Teshima was in fact good for the people because they were given some employment through the dumping operation. The local people did not agree and they made demonstrations against the Kagawa Prefecture in front of the prefectural office. However, the government did not try to understand the residents and conversely said that “the sky is blue, the water is clean, but the people’s heart on Teshima is grey” (from an interview with Mr. Sunagawa, a member of Teshima Resident Council against Illegal Industrial Waste Dumping). People realized that it was difficult to prevent the government from letting the operator to conduct this illegal business.

At the same time, the operator changed its strategy and applied for a license to cultivate worms. The operator got permission in 1978 as an industrial waste disposal contractor limited to dealing with only sludge, wood waste, etc., and change it into soil meliorated by worms. (Kagawa Prefecture 2003). Based on this application, the people were satisfied because this was not hazardous. After obtaining the license, however, the operator began to bring a car parts shredder and burnt shredded car parts in the field. That was very bad and affected the wildlife around the island and human health. Because of the smog produced from the open burning, serious cases of coughing at the secondary school on Teshima was 10 times higher than the national average (from an interview with Mr. Sunagawa, a member of Teshima Resident Council against Illegal Industrial Waste Dumping). When the islanders took the situation seriously, they resumed protests. Kagawa Prefecture however said that since the operator just collected valuable things, this was not waste.

The residents of this island applied many times to Kagawa Prefecture against the illegal dumping but the government did not answer them. Unexpectedly in 1990, the Hyogo Prefectural Police came into Teshima and arrested the operator. Their investigation revealed that the total industrial waste illegally dumped amounted to 560,000 tons and 49.5 cubic meters, which expanded the island by 130 meters from its original shoreline (GEC 2005). However, the penalty was just 100,000 yen and 5 months in jail (from an interview with Mr. Sunagawa, a member of Teshima Resident Council against Illegal Industrial Waste Dumping).

After Kagawa Prefecture finally admitted the illegal dumping activity, they issued a command to remove the waste from the island (Kagawa Prefecture 2003). The operator said the total amount of illegal waste was just 2,000 tons, but the total amount of waste was actually 500,000 tons. At that time and according to a survey, it was found that it was 560,000 tons and not hazardous (from an interview with Mr. Sunagawa, a member of Teshima Resident Council against Illegal Industrial Waste Dumping). Kagawa Prefecture said it is not



harmful for the health of residents, but the people did not believe them and got advice from some lawyers.

At that time, the Hyogo Police Department did some interviews with the Kagawa prefectural officers. From those interviews, the officers identified that the operator, Matsuura, was a kind of mafia. The people on Teshima submitted these interview results to the Kagawa Prefecture Parliament, and the parliament president said that if this information goes out to the public, it would be a disaster for Kagawa Prefecture, so please wait for a solution (from an interview with Mr. Sunagawa, a member of Teshima Resident Council against Illegal Industrial Waste Dumping). The residents of Teshima waited for this solution for two years. The residents continued activities against illegal dumping with the Kagawa prefecture officers, NGOs and other communities.

Some lawyers helped the residents prepare applications, and the residents officially submitted documents to the Environmental Pollution Control and Coordination Committee. The committee did a survey on Teshima, and it found out that some elements in the soil and water were higher than the national average, which meant it was hazardous.

Finally, Kagawa Prefecture admitted that this was hazardous but they did not want to spend too much money for this and just covered the land with dirt and made an underground wall to prevent from running off the hazardous water to the sea. The people were not satisfied and made another claim against Kagawa Prefecture. For example, everyday for half year, five people from Teshima went to the Kagawa prefecture office and in silence distributed the claim brochure to the people. They did many demonstration activities (media, TV program etc.) to ensure that the committee of this prefecture understood Teshima's problem. Teshima residents had always demanded the removal of the illegally dumped industrial waste and restore the nature of the island throughout these campaigns and trials (GEC 2005).

Based on this kind of long time activities by the people of Teshima on June 6, 2000, Kagawa Prefecture's governor made an apology to the residents of Teshima and agreed to take away the waste from this island (from an interview with Mr. Sunagawa, a member of Teshima Resident Council against Illegal Industrial Waste Dumping). **[By Badamsed Delgermaa]**

Figure 4: Display of the layers of illegally dumped industrial wastes



Figure 5: T-shirts and cap used in a demonstration of Teshima residents



### 3.2. Intermediate Treatment Plant

#### *Foundation*

The intermediate treatment plant built on Naoshima is the result of careful consideration by both Kagawa Prefecture and Naoshima Town to get the best plan for not only treating the illegally dumped industrial wastes on Teshima Island but also to spur economic development on Naoshima Town. The first target was to provide facilities for treating the waste. The second one was to meet a reasonable criterion for the establishment of an Eco-Town on Naoshima so that Naoshima Town can get a national subsidy to revive the town's development. The last one was to be able to maintain Mitsubishi Material Corporation and revitalized the town's economy by locating recycling industries in the town (GEC 2005). In September 2003, the construction of the intermediate treatment plant was completed and it started operation.

Figure 6: Ongoing excavation in the illegal dumping site    Figure 7: Intermediate holding and packaging plant



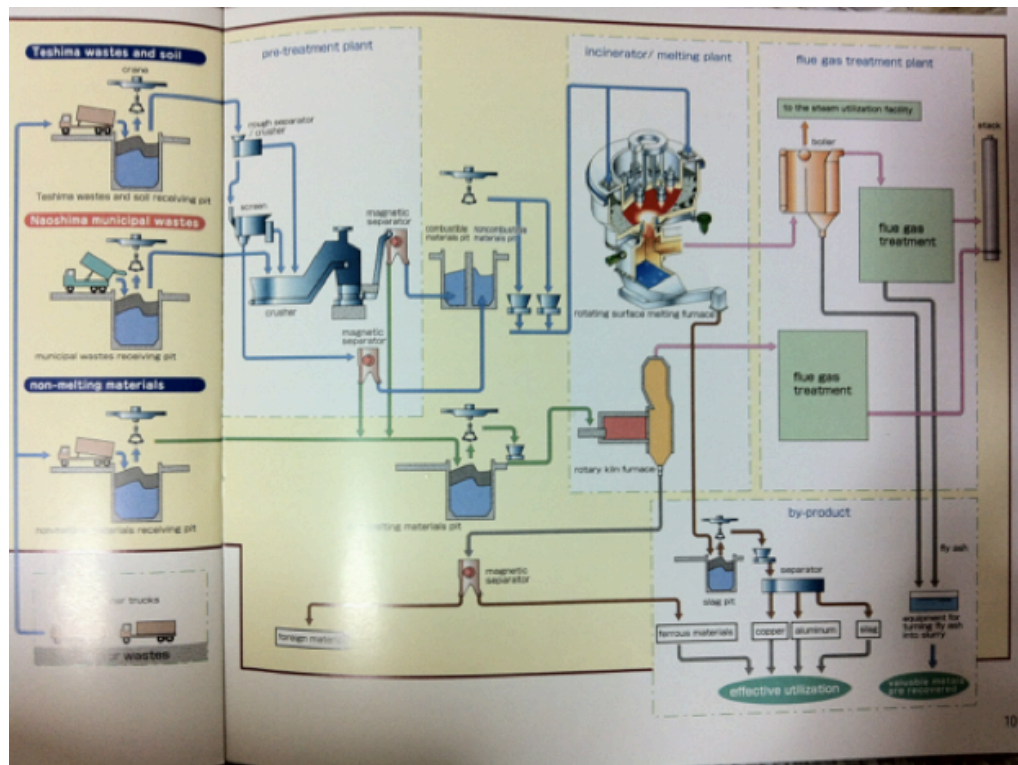
***Intermediate treating process (Katsuya Kawamoto and Kuniko Urashima, 2006; Kagawa Prefecture)***

The waste which is transported from Teshima to the intermediate treatment plant is firstly separated and crushed finely during a pretreatment process. Ferrous materials are then removed by magnetic separation, and rocks and other non-melting materials are incinerated by the rotary kiln furnace. At the end of this process, iron can be recovered for reuse. Melting materials are then transferred to a rotating surface melting furnace for high temperature decomposition of dioxins. Melting products are molten slag and fly ash. Due to a high component of shredder dust from copper wire, aluminum, and stainless steel from auto parts on Teshima's waste, special crushing and selection, along with separation by specific gravity, are used to separate and refine the metal in the slag for effective uses and to enhance the quality of the slag by reducing metal particles.

After quality control is carried out on the slag, it is used as a material for a concrete aggregation in public construction in Kagawa Prefecture. The fly ash, which contains a lot of metals such as zinc and lead, is mixed with water to form a slurry and sent to the nearby Naoshima Refinery at Mitsubishi Materials Inc. to be used as a raw material for precious metals recovery.

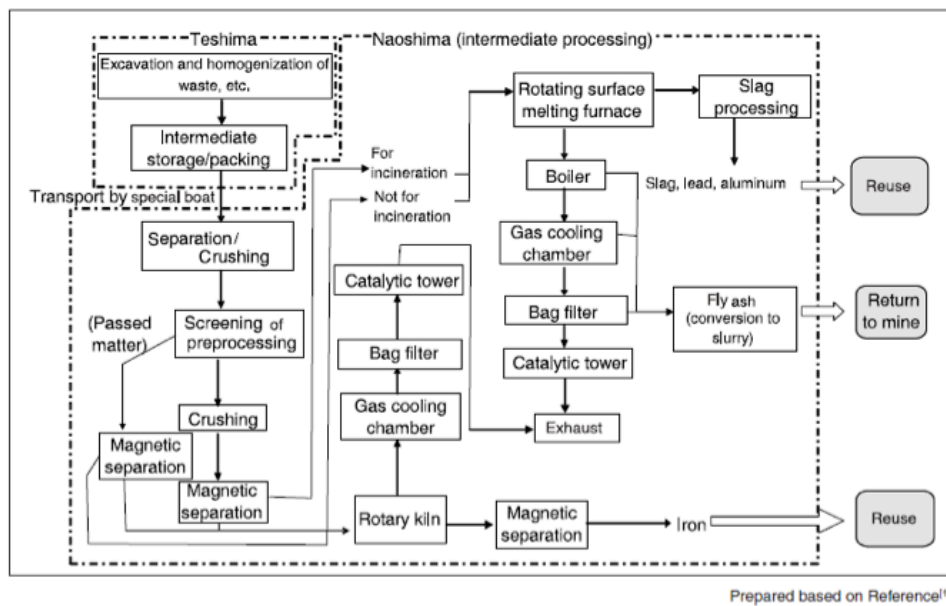
The exhaust gases produced are processed in the same way as the melting furnace system. The waste gas is completely treated before being released with the set up of stricter standards regarding harmful substances than even the emission regulations of the Air Pollution Control Law.

Figure 8: *Intermediate treatment process*



Source: Kagawa Prefecture (2004)

Figure 9: The flowchart of waste processing on Teshima and Naoshima (Katsuya Kawamoto and Kuniko Urashima, 2006)



### ***The intermediate treatment plant for Eco-Town project***

To fulfill the features of the Eco-Town Project, the plant was constructed with advanced technology facilities for the complete treatment and effective recycling of byproducts. The main melting process is conducted using multipurpose furnaces to remove toxins, melt the waste, and separate metal materials for recovery. Regarding environmental concerns, a number of efforts have been made to reduce the environmental load created by these facilities. To this end, the plant's wastewater and rainwater are reused to cool the gas and, surplus heat is recovered and used to generate steam, and a solar power system has been installed. Fly ash, which is produced in the melting process, is treated and its valuable metals are recovered at the Naoshima Refinery Facility at Mitsubishi Material Inc. located next to the plant. Slag is recycled and utilized in construction materials such as aggregates in concrete. In addition, metals such as copper, iron, or aluminum are also collected and effectively utilized (Kagawa Prefecture 2003). [By Nguyen Thi My Quynh]

## **IV. Lessons learnt and future challenges**

### **4.1. Lessons learnt on Naoshima**

The beautiful scenery of the island could be favorable for the development of tourism on Naoshima. However, it seems that the tourists visit the island principally because of the contemporary arts developed by Benesse Corporation. Contemporary arts by world famous artists are truly attractive not only to domestic tourists but also foreign ones who do not always consider Japan as their first destination due to the high prices and travel costs. What is a surprise to see is that the local people and the local authorities seem not to be very interested in making money from that attractiveness. They much depend on Mitsubishi Material Corporation economically; therefore, they are not interested in developing a tourism business. However, the local people are changing their minds to develop tourism for their own benefits. There is no conflict between industrial development and tourism development (eco-tourism), so it could be a wonderful idea if the two industries could be combined for the general purpose of development on Naoshima.

A great idea for Naoshima to try is to develop the image of an "art town". Visitors can enjoy the art at every corner of the town including the Naoshima Public Bath which is an art facility serving both local people and tourists through a local restaurant. Many waste items are used to create the artworks on Naoshima. The arts, somehow, should be more encouraged to develop more systematically and local people should get involved into the creation of arts on Naoshima.

Naoshima Town made a wise decision to revitalize the town's economy with this eco-town project, because they can get subsidies from the government for treating the industrial waste from Teshima and also the sustainable development trend for the island.

In terms of waste treatment, there is a close cooperation between Naoshima and Teshima, because, on one hand, the intermediate treatment plant of the illegally dumped industrial waste from Teshima was constructed nearby the Naoshima Refinery Plant of Mitsubishi Materials Inc. so that byproducts can be recycled and reused effectively based on the advanced technology of the company. On the other hand, the pre-processed waste from the intermediate treatment plant has been supplying a part of the materials for the Naoshima Refinery Plant of Mitsubishi Material Inc.

#### **4.2. Lessons learnt on Teshima**

Environmental education has now become a major purpose on Teshima Island which used to be famous for illegal waste dumping. At present, visiting the intermediate treatment plant is also a good way for visitors and students to understand the technical issues and efforts made by the government and local people to solve the consequences of illegal waste dumping. It is costly and time consuming to solve the problem. With informative visual aids (videos and brochures) and good samples, visitors can easily understand what happened in the past and the seriousness of illegal waste dumping as well as modern equipment being used to process the waste. It is expected that Teshima could continue to be successful as a model of environmental education tourism in the future.

Teshima is a small island, but the social welfare has been well developed with an orphanage and a mental hospital.

#### **4.3. Future challenges**

##### ***Naoshima:***

For tourism development, it seems that the Benesse Corporation is making their monopolistic business on Naoshima with contemporary arts. They are currently accepting not for profit or low profit businesses. However, the sustainability of the investment of the Benesse Corporation and the future of Naoshima should be questioned since Benesse is a monopoly and its art tourism activities continue to be economically unsuccessful in the future. Moreover, the majority of the local people are working for Mitsubishi Materials Corporation. Basically, the Naoshima economy is considerably dependent on the corporation. It could be a big challenge in the distant future if the island does not know how to diversify their industries and reduce their dependence on the two monopolies.



**Teshima:**

The future of the illegal dumping site and the intermediate treatment plant after ending the project has not been decided yet. It would be a big waste if the facilities cannot continue to run when all the illegal waste on Teshima is treated.

Additionally, like other islands in Japan, the population decrease has been a big problem for Naoshima and Teshima so far. One reason is that there is no high school, college or university in these islands. Therefore, young people have no choice but to leave their hometown for higher education. The aging population has always been a challenge for the island. The old farmers cannot or do not want to work on their farms any more; and therefore, many farms are uncultivated and have become useless on Teshima. It seems that it is difficult to find a proper solution at this moment; however, as a long-term development strategy, the Japanese government should have special policies to deal with these problems on the island. **[By Dang Nguyet Anh]**

**References:**

1. Infomap Japan. <http://www.infomapjapan.com> (accessed March 23, 2012)
2. Benesse Art Site Naoshima website, <http://www.benesse-artsite.jp> (accessed March 23, 2012).
3. Global Environment Centre (GEC) Foundation, 2005, Eco-Towns in Japan – Implications and Lessons for Developing Countries and Cities, p.59-70, [http://www.unep.or.jp/ietc/publications/spc/eco\\_towns\\_in\\_japan.pdf](http://www.unep.or.jp/ietc/publications/spc/eco_towns_in_japan.pdf) (accessed March 23, 2012).
4. Interview with Mr. Tezuka and Ms. Kumeda, local officers of the Division of Economy and Construction at the Naoshima Town Office, February 10, 2012.
5. Interview with Mr. Sunagawa, a member of Teshima Resident Council against Illegal Industrial Waste Dumping, in the Teshima Island, February 11, 2012
6. Kagawa Prefecture (2003) Kagawa Naoshima Environmental Center Intermediate Treatment Plant (brochure obtained in a visit to the intermediate treatment plant, February 12, 2012).
7. Kagawa Prefecture (2004) Teshima Waste Treatment Project, Restoration Project of Teshima Island Stained by Illegal Dumping (brochure obtained in a visit to the intermediate treatment plant, February 11, 2012).