



CONGRESS

2011

Local Governance and Environmental Sustainability in Minamata City: Beyond Deadlock and Conflict to Multi-Stakeholder Collaboration

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1.0 INTRODUCTION

Certainly one of the great challenges of our time is to learn how to create more environmentally sustainable cities that meet the basic needs of the present generation without compromising the ability of future generations to meet their own needs. [1] The world is becoming increasingly urbanised and it is estimated that now, for the first time in human history, more than half of the world's population lives in cities and that share is growing steadily. [2] Though cities are often considered as the sites of mass production, consumption and waste creation, they are also believed to present an enormous opportunity for economic growth and improving the quality of life for its citizens. [3] The value of thinking about sustainability comes precisely from that concentration, which provides opportunities for more efficient, less wasteful ways of achieving environmentally sustainable cities that are economically vibrant, provide a high quality of life and health for their residents and contribute to long-term environmental sustainability through reduced resource consumption and waste production. [4][5][6]

These arguments all point to the central role of cities in attempting to solve global environmental problems, improve economic competitiveness, and protect public health, quality of life and social equality. The cities are seen not merely as engines of economic growth and a place of concentrated markets, but also as the shared space in which most people live, attempt to shape their own environment, and broaden their opportunities for livelihood. [1][7][8][9] In a dystopian way, the post-war urban experience in Japan showed the validity of these arguments about the importance of the cities in contemporary societies. [10] After World War II, the main priority of the Japanese government was rapid economic growth and rebuilding the country based on the strategy of industrial development. Because there was such a clear necessity to recover from the destruction wrought by the conflict, the alliance of central government bureaucrats, the ruling Liberal Democratic Party (LDP), and big business gave industry a free rein to pursue the country's development strategy. Samuals has called the period from the end of the War to the middle of the 1960s, as a "*conservative's paradise*" in which there was an "*unassailable consensus*" on economic reconstruction and rapid growth. [11] The Japanese urban planning and land use policy long put top priority on economic growth and industrial development over environment and urban quality of life. This contributed to rapid growth and also to the development of a wide range of urban environmental problems that have tended to limit the translation of high incomes into a high quality of life for most urban residents. Degraded urban environments, expensive and cramped housing, and the shortage of public space and parks, have all been major contributors to create the "*Rich Japan vs Poor Japanese*". [12][13]

There has been a growing awareness that business as usual or government as usual is not giving the progress needed to achieve the goals of sustainable development. [14] The new phrases like "*eco-*

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friendly”, “*recycling-society*”, and “*low-carbon society*” are all now familiar to everyone and bring new perspectives to re-think the way we live in the society and stress the importance of engaging different stakeholders into the governance of the shared space. This evaluation of the importance of local environmental governance for sustainable development started in the early 1990s, following the Local Agenda 21 (LA21), the blueprint for a sustainable development that came out as a result of the Rio Summit in 1992. The LA21 formally introduced into the agenda the concept of key stakeholders in society and recognised the need to engage these stakeholders collaboratively to solve urgent problems of urban liveability and sustainability. [15] Stakeholders are those who have an interest in a particular decision, influence a decision, or can influence it, as well as those affected by it, either as individuals or representatives of a group. [16] Urban environmental management is a key policy area in Japan today because it sits at the intersection of two opposing forces: the traditional top-down, public-works oriented construction state and the growing citizen movements for improved living environments. [1][8] The tenacity of the central government to take responsibility of urban planning and management and resist the dilution of its authority to make urban policy is ample evidence of how important the control over urban land and development has been in the Japanese political economy. By contrast, there is a rise in citizen’s movements to voice their desire to gain more local control over urban spaces and neighbourhoods. This conflict indicates that the management of change in shared spaces is an important governance issue in Japan, not merely a technical matter of applying existing regulations or environmentally sound technologies and spending infrastructure budgets.

This paper therefore aims to explore the case study of Minamata City and argues that a local governing process is the key to creating more environmentally sustainable cities. Minamata City gained notoriety for a disease that became to be known as Minamata Disease, due to the negative effects of economic growth and industrial development over environment and urban quality of life. It not only posed a direct health hazard, but also precipitated socio-economic and political problems and divided its residents and city administration, which led to a deadlock of its administration functions for over 30 years. However, the city has gradually transformed itself into an environmentally sustainable city, adopting a series of innovative policies and practices for facilitating a multi stakeholder process in revivals of the city. As a result, the city was certified as one of the first six ‘Eco Model City’ by the government of Japan in 2008. The outline of the paper consists of four main parts. After this brief introduction, it discusses the historical development of the city and its negative legacy of Minamata disease as a symbol of distorted modernisation in post-war Japan. Then, it will present in detail some of the innovative local policies and practices developed and adopted for the revival of city, including Jimotogaku, community waste separation and collection system, and women’s recycling network. Finally, the paper concludes by discussing the key findings based on both general experience and case study evidence.

2.0 MINAMATA CITY AND ITS NEGATIVE LEGACY OF MINAMATA DISEASE

2.1 Historical Development of Minamata City

Minamata City is located in the southern part of Kumamoto Prefecture on the island of Kyushu, facing Minamata Bay in the Shiranui Sea. The 162 square kilometre (km²) city is surrounded by mountains and rolling hills on three sides and straddles the mouth of the Minamata River where it opens into the sea. Richly vegetated mountains occupy 75 percent of the city’s land use, while residential areas are scattered along the river valley, it is indeed a microcosm of Japan’s natural features. It was a small traditional farming and fishing village in the Meiji Era. Later, the city was designated as a town council in 1912, when a railroad connection and other important infrastructure facilities were laid down aiming to accelerate the modernisation in the city. As a result, Minamata became one of the modern cities in Kumamoto Prefecture, emerging from the devastation of World War II. The population reached its peak of 50,461 in 1956, when the city limits were redrawn to encompass a nearby village called Kugino. However, since then, the population has been in a decline and by 2010, the total population of the city was 27,000 people, with 12,000 households and has a high proportion of aged society at about 30 percent. [17]

2.2 Minamata Disease and its Negative Legacy

The city however, gained notoriety for a disease that became to be known as Minamata disease, caused by the industrial release of untreated wastewater containing methyl mercury into Minamata Bay. Chisso Co. Ltd. (hereafter known as Chisso), which was responsible for the pollution, started its operation in Minamata City in 1908. The establishment of Chisso in Minamata City contributed greatly not only to the creation of employment and economic growth of the city, but also to the modernisation of the entire region of Kumamoto Prefecture. Chisso was originally setup as a hydraulic power plant and gradually shifted its industrial functions towards the production of chemical fertiliser, acetic acid, chlorinated vinyl and softeners needed for shaping plastics. It was the first company in Japan to produce vinyl chloride in 1941. [18]

In 1932, Chisso started to use inorganic mercury as a catalyst to produce acetaldehyde and for 36 years continued to discharge the untreated waste water containing methyl mercury, the by product of the process, into Minamata Bay. During this period, fish catches decreased and the number of Minamata disease patients began to be identified in fishing communities. Numbness occurred in their limbs and lips, speech became slurred and their vision became constricted. Some people had serious brain damage, while others lapsed into unconsciousness or suffered from involuntary movements. People saw that the cats were going insane and birds were strangely dropping from the sky. Series of these unexplainable occurrences caused a panic in Minamata City. [19] In 1956, the disease was officially recognised and a group of researchers from the Kumamoto University Medical School identified that factory effluent was the source of pollution. [20] However, the local government aligned with the factory and denied this charge and Chisso kept producing and paid incentives to people who opposed the dumping into the bay. As *Growth Machine Theory* [21] suggests, economic actors had such a strong influence over local decision making, even in cases where such growth is not in the interest of most residents and their liveability.

In 1968 the Japanese Government acknowledged the cause of Minamata disease was the waste water discharged by Chisso. [19][20] By that time, the pollution and damage had spread considerably and the number of patients multiplied. As of February 2011, more than 22,000 people from Kumamoto and Kagoshima Prefectures (including Minamata City) have applied for certification as Minamata disease victims. Out of them, 2,271 were officially certified by the government eligible to receive compensation. [22] The certification of Minamata disease has been conducted by the Official Certification Boards on Minamata disease according to the medical criteria laid out by the Ministry of Environment. The eligible persons were issued lump sum consolation payments, expenses for medical treatments, and allowances for nursing, moxibustion treatment, hot spring treatment, funeral expenses and life-time special adjustment allowances. In addition, 10,353 people have been declared eligible for relief programme based on the national government's 1995 settlement plan to aid uncertified patients. [18][20] However, the exact number of victims is hardly known because people died before the official discovery of Minamata disease and also people died after the discovery but before they could apply for official certification or medical assistance. Further, a large number of patients avoided applying for benefits due to fear in facing Minamata disease discrimination, and the applications of some potential victims were turned down.

It was widely argued that Minamata disease not only posed a direct health hazard, but also precipitated socio-economic and political problems. [20][23][24] It divided residents, Chisso and the city administration, which led to a deadlock of city's administration functions for over 30 years. The disease polluted the bay that used to be a natural sprawling ground for fish and affected the livelihood of the people, who were making a living in the fishing industry. Further, it damaged the economy of Minamata City, which was depended only on Chisso and its affiliated companies. During these years, the average income in Minamata City fell from the second highest in the Kumamoto Prefecture (after Kumamoto City) to the lowest. As the company that caused Minamata disease, Chisso was responsible for compensating victims. However, with the poor financial situation in 1975, Chisso raised its concern that it could no longer pay compensation to the victims. As a result, Kumamoto Prefecture allocated prefectural bonds that amounted to 260 billion yen during the period of 1978 to 2000 to

support Chisso financially and since 2000, the national government has required Chisso to start repayments schemes, which aim to prevent the economic blow that would befall Minamata City if Chisso goes bankrupt.

Further, Minamata disease caused rumours and the consequent development of antagonistic feelings among the citizens. After its official recognition in 1956, Minamata disease was believed to be a communicable disease. Due to the failure of the local and national governments in correcting this wrong perception, Minamata citizens suffered considerably due to discrimination against people who had a mysterious, contagious disease. There were many instances in which people from other parts of Japan avoided buying primary industry products from Minamata, fewer tourists visited to the city, passengers who passed through the city closed their windows once the train entered the city, and people from Minamata faced discrimination in marriage, employment and schooling and lost their pride in being residents of Minamata City. In addition to this rumour-induced damage, the Minamata disease issue generated much deeper antagonism among the different stakeholders in the city. Hostility first arose between the patients and Chisso, and subsequently grew within the community itself. For example, the hostility grew between Minamata disease sufferers because of the different levels of compensation. Conflict also started between sufferers and non-sufferers, sufferers and administrative authorities, and the public and supporters of the sufferers.

3.0 BEYOND THE DEADLOCK AND CONFLICTS: THE REVIVAL OF MINAMATA CITY AS ENVIRONMENTAL SUSTAINABLE CITY

3.1 Initial Responses and Consultation

In 1971, the Citizens Network Council for the Emotional Support of Minamata was established by a group of Minamata victims who aimed to find an early solution for the compensation issue, improve the environmental pollution victim's relief system, reclaim the mercury contaminated sludge in the bay, revitalize the city's economic structure and encourage new enterprises. However, some parts of the victims reacted strongly to this citizen network and criticised their activities as seeking a swift settlement of the issue. Given these circumstances, the development of a movement of all citizens to take steps toward dealing with Minamata disease encouraged the establishment of the Minamata Citizen's Movement in 1977, which brought together 27 groups including representatives from each faction of victims, Minamata City Council, labour organisations in Chisso, as well as political representatives in the area. The group unanimously decided to demand the prefectural and national governments to take steps to provide full relief measures for Minamata disease sufferers, environmental restoration, revitalisation of Minamata City, and establish special legislation for environmental protection. [25]

As a result, the environmental restoration of Minamata City started in the same year by the prefectural government with the efforts to dispose of the sludge in Minamata Bay. It was estimated that about 70-150 tons or more of mercury that was mixed in with effluents from Chisso was discharged into the Minamata Bay until the factory stopped manufacturing acetaldehyde in 1968. [18] The *Minamata Bay Pollution Preservation Project* was initiated by Kumamoto Prefecture to dispose of sedimentary sludge in Minamata Bay containing more than 25 parts per million (ppm). In order to prevent the spread of contaminated fish, Kumamoto Prefecture placed the nets and closed the bay for a period of 23 years until the area was completely remediated in 1997. After the removal of the dividing nets, the level of the mercury in fish species in Minamata Bay was tested twice a year for a period of three years and finally, it was declared that Minamata Bay was as safe as those in other regions in 2000.

In 1990, when the *Minamata Bay Pollution Preservation Project*, which was undertaken to reclaim mercury-laden sludge from Minamata Bay, was officially completed, Kumamoto Prefecture introduced the next project called the *Minamata Redevelopment Promotion Office* to work on rehabilitating the city. The officer in-charge, who was appointed by the prefectural office, prepared the Blueprint for Minamata Restoration in 1993 after consulting with different groups during his official visit to the city every week. This first official document recognises the importance of building a

community consensus and the need to eliminate the image of a shunned locality as the fundamental strategies for the environmental restoration in Minamata City. [20]

3.2 From Consultation to Consensus-building

Stimulated to a new awareness by the prefectural government's efforts and initiatives, Minamata City itself started to act on the revival of the city. It started with the *Minamata Environmental Creation Development Project* in 1990, under the motto of *a vision of becoming a Model Environmental City*. At a memorial ceremony for Minamata disease sufferers in 1994, Mr. Masazumi Yoshii, who was elected as the Mayor of Minamata City in February 1994, apologised to the victims of Minamata disease for the first time on behalf of the city administration. Yoshii, who is from a village family in the mountainous area of Kukino, believed that antagonism could produce nothing. Thus, the differences among sufferers, non-sufferers, Chisso and the city administration had to be eliminated for the regeneration of the city. [26] So, he invited all these sections of society to join hands in redeveloping the city in his well-received speech. This was known as the *Moyai-Naoshi Movement*, which was an appeal to start working together. It was the first step taken by the city administration to move away from the deadlock and conflicts towards a revival of the city.

Yoshii's speech was different from other political speeches and the message was contrition and apology. He stated that the city's past action on Minamata disease was wrong and proposed a solution for consensus-building through dialogue to solve the problem at the community level. After the speech, various victim groups, which had been split until then, agreed on the dialogue for seeking a solution for the issue. [20][23][24][26]

The Citizens Group for the Settlements of Minamata Disease Issues and Support for the Regeneration of the City was established under the chairmanship of the Mayor and represented over 194 civil society and business organisations active in the issue. Further, realising that the new partnership would require enough opportunities for many stakeholders in Minamata City to meet, and number of venues where they could talk, the city held a variety of events, including public lectures, dialogue meetings, and community workshops to discuss how to re-create the city in such a way as to ensure that the sacrifices of Minamata disease victims would not be in vain. The city has engaged in activities such as constructing and running Moyai-Naoshi Community Centres for creating space for interaction among stakeholders as well as providing a base for the provision of social welfare services and for holding events, such as the promotion of seeding forests and the Minamata hearty festival.

As a result, different stakeholders started to state their views and explored their views with one another in dialogue in order to develop mutual understanding. Though there was confusion and hesitation when the dialogue between different stakeholders began, continued efforts of opinion exchange and conversation maximised their ability to resolve their differences and brought citizens to regain the energy to regenerate the local community, thus creating opportunities where victims, citizens who were not victims and employees from Chisso would meet together; mutual understanding and dialogue eventually became a common affair. Gradually dialogue between the victims and the rest of the citizens started taking place and their communication was improved.

3.3 From Consensus-building to Participation in Decision-making

Subsequently, Minamata City changed its administration system and took an attempt to facilitate greater public participation in planning and decision-making. Minamata City started to prepare its Third Comprehensive Plan, an overall plan for the regeneration of the city, along with the citizens. As former Mayor Yoshii argues, the main idea was not only to consider the administrative views in the formulation of the plan, but also the views of Minamata citizens. [23] The city created the space and opportunities to bring all concerns into the process of planning and decision-making and provide relevant information, which enabled them to act responsibly. Two open assemblies that met once every week for six months were held in all 26 districts to encourage direct dialogue with local residents and citizens who were appointed based on their application essays. Further, stakeholders were invited to

state their views through organising seminars, such as the Minamata 21 Plan Citizens Conference (1994) and the 21st Century Minamata Citizens Conference (2000), letters to the mayor (1,400 letters were received between 1994 and 2000) and informal local meetings with citizens (4,200 participants over the same period). [20][27]

This made Minamata the first municipality in the country to develop a future image as a sustainable city of industry and culture working toward environmental restoration and industrial rejuvenation that was accomplished through encouraging stakeholder participation. The Third Comprehensive Plan, which led to the declaration on the construction of an environmental model city satisfied the needs and aspirations of different stakeholders involved in the process and valued the environment, health and welfare of the citizens, set forth six basic elements: resolving the Minamata disease issue and restoring and reshaping the environment, creating working environments in which people can coexist with nature, creating people-friendly livelihoods, creating a vigorous and vibrant community, creating Minamata's culture, and developing the community with citizen participation. [20] Minamata City has given this plan LA21 status and has positioned them as measures that are to be implemented under the collaboration of the administration, citizens and the private sector. [27]

4.0 LOCAL ACTIONS FOR ENVIRONMENTAL SUSTAINABLE CITY

As former Mayor Yoshii points, sustainable development requires stakeholders, all of whom are part of polluting the environment in some form, to build a partnership based on a sense of collaboration and trust to minimise or prevent them. [26] Thus, new approaches are taken to get different stakeholders more involved in the future of their cities so that they can adopt an attitude that is oriented around cooperation rather than the pursuit of individual interests. This section discusses some of those innovative policies and practical actions taken by Minamata City to provide space for stakeholder participation and building partnerships leading to common actions for creating an environmental sustainable city.

4.1 Jimotogaku

One of the core methods adopted for rebuilding the community was Jimotogaku (*Community Studies*). As Mr. Tesuro Yoshimoto, who is the head of the Jimotogaku Association as well as served as Chief of the Environmental Planning Division of Minamata City at that time argues, in order to achieve the environmental sustainability at the local level, the capacity of the residents to make appropriate decisions and the ability to take action as the agents of change need to be fostered. [28] In presenting the concept of development as freedom, Amartya Sen contends it as: "*I think where the basic needs perspective went wrong was to treat human beings as if they were patients rather than agents. You know, human beings are agents of change also. So if you have to decide what to be done in slums, that is not a question of finding out what slum dwellers would need. You have to find out what they would do if they have a freedom to do it, and how you could enhance that freedom*". [29] This required the citizens to have sufficient knowledge about the local environment. Only after fully understanding the production, consumption, and reproduction cycle existing in the natural environment in their local community could residents developed their own action plans to achieve environmental sustainability.

Therefore, Yoshimoto introduced a new community planning methodology to find out about local resources by working with the community members themselves, which was called Jimotogaku. The core idea that lies under Jimotogaku is how to create the society where people can coexist with nature as well as how to encourage people to search for what they have rather than what they need, finding out their own local resources, new values and meanings for establishing sustainable lifestyles. This is what Kretzmann and McKnight explain in their bestselling book *Building Communities from the Inside Out* (1993): "*The community building starts with the process of locating the assets, skills and capacities of local people and their associations. The process of recognizing these capacities begins with the construction of a new lens through which communities can begin to assemble their strengths*

into new combinations, new structures of opportunity, new sources of income and control, and new possibilities for production". [30]

The city officials formed a *Yoro-Kai* at each local community (there are 26 districts in the city), gathering at least ten citizens from the age of 20 to 50 from each of the 26 districts for implementation of Jimotogaku. The groups began to search what they have, that is, finding out their own local resources, as well as their values and meanings for their own lives through community field visits. Community members along with trained facilitators (officials of the local authority) just walk around the community and identify what they found very unique, interesting and surprising in their community. Any kind of assets, including natural environment, human activities, products, skills, infrastructure, building, equipments, or even spiritual symbols can be searched for and recorded. When they found one of the items listed above, they recorded it in a notebook, or draw a picture or sketch, or took photos. After coming back from fieldwork, the findings were compiled together. There are several ways to compile the findings, such as local information cards, a photo or illustration, a local resource map, an agriculture calendar and a human resource map. After that, discussion groups were formed so that citizens could share their findings and discuss how their available local assets could be best utilised to create a liveable and sustainable community as well as exchange views with other stakeholders, such as the local authorities. As a result, various local actions were designed that aimed at creating an environmentally friendly sustainable society.

One of the examples is the Life Museum of the Whole Village. This local initiative was started in Kagumeishi, one of the communities located at the last end of Minamta City in mountain area at the border of Kagoshima Prefecture. It is a tiny agricultural village with around 45 households. When the community suffered constant decline when the young generations left for cities and the remaining elderly generation found it difficult to live and had less enthusiasm for their own community, the city officials contacted them and asked about their interest in receiving visitors who come to the city to learn about the Minamata disease. They accepted the offer from the city office with less enthusiasm. According to community leaders, at the beginning, the community wondered whether they could attract outsiders without anything special to show the visitors. They do not have a building as a museum or any specialised person to guide. Only because of the city official's request, people in the village agreed to start the activity. However, when the visitors, including students from high schools and universities, researchers, officials and some ordinary people from larger cities started to visit their community and even sometimes did a homestay, and as those outsiders asked the local people many questions on their local life of the rural communities and show great interest in their nature, traditional lifestyles and local foods. The community members were shocked to learn that people from advanced cities admired their lifestyles, though they were ignorant about its value for a long time. This encouraged them to practice the Jimotogaku fieldwork to communicate what they have, make resource maps of the area, and prepare to explain about their communities to the visitors.

Currently, anyone who visits this small community will be guided by the ordinary citizens who show various places of the village, such as rice terraces which have been inherited for hundreds of years, small streams and large rocks that explain the origin of the village name, traditional small shrines that have been taken care by the community, water resources of the village, and other traditional equipment or household practices. They also serve local foods that utilise local materials available in the community and are cooked in a very traditional manner. According to the village leaders, after starting the museum, many changes happened in this small community. They received many guests from outside, which bring in outside money to the community (visitors had to pay for the tour guide, meals, and any other material costs) as well as provide a great opportunity to exchange with outside people. Further, the museum activity helped to re-vitalize economic activities of the village. Stimulated by outsiders' interest and their advice, there are some villagers who started innovating their own traditional products such as vine baskets or tried to plant new crops that can be sold to the town people. The village women started food processing activities by cooking traditional local foods and started a restaurant by renovating the old school building. They also pack traditional foods into a lunch box that is delivered to the city office. Most importantly, the villagers started to become aware of the richness of their village life, and restored their self-confidence in their own village. They hope to

attract the young generation to come back to and live in the town where over-aging and depopulation have been a major concern for many years. In 2005, this community received an award from the Ministry of Agriculture as a thriving rural model place. In Minamata City, there are now four communities joining this initiative.

Another innovative action born from the Jimotogaku practice was the creation of a District Environmental Agreement. After community members identified and mapped the natural resources in their community, researched their culture, history, tradition and customs, analyzed the lifestyles of the people, production and consumption processes of various products consumed, and the treatment and recycling process of waste generated in community, they identified the importance of their findings by creating commonly agreed upon rules for residents to protect their environment and lifestyles and promote efforts to observe or monitor those rules by themselves. There are currently eight communities in the city that have their own district environmental agreements. The minimum rules include the following: protect the forest and water bodies, reduce household waste, increase recycling, promote reuse, prevent illegal dumping, self-organize a disaster management system, create a community patrol. Community members at the general meeting agreed upon these rules. Then, all the households are to sign the agreement and disseminate it in communal places. Further, a copy of the district environmental agreement is submitted to the city office for approval.



Figure 1: A district environmental agreement disseminate in public space

Minamata City established the Environmental Masters Programme in 1998 to recognize the local producers and craftspeople who are employing and promoting environmentally-friendly and environmental health-conscious production, etc. Its aim is to elevate the social status of local producers and utilise their wisdom in community building. Applicants are judged based on how long they have engaged in the field and on their use of chemical products and waste prevention strategies. Those who have been found eligible must attend three lectures. The first lecture is on the basic knowledge of Minamata disease, the second lecture is about the structure of the natural ecosystems and the final lecture provides basic information on toxic substances, such as environmental hormones. So far, 34 people including individuals engaged in organic farming (tea, rice, orange and vegetables) and artifice (Japanese paper, tatami, soap and woodwork) have received acknowledgement from the Mayor of Minamata City and their productions are displayed on the city web-site.

4.2 Community Waste Separation and Collection of 23 Categories

In 1992, there was an explosion that occurred at the bulk-waste crushing plants in Minamata City. It was identified that the cause of the explosion was the mixing of propane gas cylinders with other garbage, which was segregated only into two categories by households at that time. After this incidence, citizens and the city officials worked together to find the best solutions for the issue through

organising a series of seminars and workshops. Based on the discussions, they concluded that the citizens would have to change their lifestyles and the way in which they throw away everything. These lifestyle changes led to the creation of a sustainable material-cycle society and ensured that the city authorities would provide an effective policy framework and a supportive collection system to facilitate the citizens' efforts. As a result, a new waste separation and collection centre system was introduced in 1993. The residents are required to sort their waste into 23 categories at community level in efforts to recycle the city's municipal solid waste. This sorting and collection system is a pioneering achievement and the most advanced trash sorting system in Japan.

More than 300 public meetings were organized by the city officials with the citizens before a consensus was reached and the new waste separation and collection system was introduced. The local newspapers, television channels, radio stations and the website of the city were also utilised to share information on the new waste separation and collection system with the citizens. Further, city officials along with the leaders of neighbourhood associations visited waste collection stations, provided guidance and answered questions raised by the citizens until the officials were very familiar with the people. Currently, there are about 300 stations for collection of recycling materials in Minamata City, each one handles waste from 50-100 households. The recyclable materials are collected once a month at the recycling stations and the annual collection schedule for each station is prepared in advance after a consultation between city officials and community leaders. On collection days, about 13 containers are set out at the recycling stations for citizens to separate and store their waste. There are two or three community members at each station to make sure garbage is classified properly, and this duty rotates among community members. The collection and transportation of separated materials is carried out by the respective recycling factories the following morning. Since 2002, the city has been collecting kitchen waste sorted at the household level twice a week and the kitchen waste is used for creating compost through private-sector contracting, and used in the utilisation of salad onions, which are a speciality of Minamata City.



Figure 2: Waste separation and collection stations provides space for meeting and mutual learning

The whole idea of Minamata City for providing a space for creating broader citizen actions, which is characterized by mutual learning to acquire their own resilient power in making environmentally sustainable cities and these waste separation and collection stations have become very productive. It created a space for community members to interact regularly, share information, learn about environmental issues, and build closer ties through working together, which resulted in building social capital in the community. Moreover, it brings economic and social benefits for the local residents. For example, community recycling efforts from 1993 – 2009 raised over 100 million yen for the city. As city officials argue, recycling materials recovered by the citizens can have a high commercial value because the wastes are thoroughly sorted and cleaned out (the yield rate is 55 percent, higher than that of other cities). Instead of keeping the money to pay for the higher waste management costs, the city returned the money to local communities for improving the neighbourhood environment. Each year the

sale of the recyclable materials earns between 5 – 6 million yen, which is given to the city's 26 administrative districts. People in the particular area have the freedom to decide the way they are going to use the money. Most commonly, it is utilised for improving the neighbourhood environment, such as installing street lights, maintaining of public parks and children play area, as well as organising some social/cultural events, such as sports meeting and neighbourhood festivals. In this way, the money the community raised is used as an incentive and will hopefully encourage citizens to increase their recycling efforts in the future. [17]

Putting recycling into practice, which is sorted by citizens and promotes new enterprises for reuse and recycling of materials for revival of the city's economy, the Eco-Town Centre was established by Minamata City in 2001. About seven recycling facilities are already established in the Minamata Eco-Town Center, which was built on a 20 hectare (ha) brownfield site. Total investment in the centre, which employs roughly 120 people, was approximately 6 billion yen. The key recycling activities located in the Eco-Town are: a glass bottle reuse and recycling facility, a consumer appliance recycling facility, waste plastic compound resin recycling facility, oil recycling plant, a fertiliser manufacturing facility using sewage and other materials, tatami recycling plant and organic wallpaper production plant. [17] [23] Aiming to encourage new waste recycling business in the city, Minamata provides eco-town subsidies (10 million yen maximum) for business projects approved by the national government and Minamata City. Further, Minamata City worked along with the companies in the Eco-Town to establish a framework in which the citizens can learn about the relationship between their daily life and the 3Rs through site-tours and by holding an "Eco-Town Festival". This has led to an enhanced citizen's awareness about the environment and resources value of the wastes they sort out in their daily life.

As a result of promoting extensive recycling in the city, the amount of garbage to be incinerated has been reduced by half, from 10,008 tons in 1992 to 5,638 tons in 2009, and this has resulted in reducing the amount of garbage to be land-filled by 80 percent (from 2,729 tons in 1992 to 531 tons in 2009), extending the life expectancy of the city's landfill site. The total amount of garbage was also reduced by 21 percent, from 10,008 tons in 1992 to 7,885 tons in 2009. In addition, the material recycling ratio of total garbage was increased by 35.5 percent, from 9.2 percent in 1993 to 44.6 percent in 2009. It was noticed that the recycling ratio has doubled since 2002 with the introduction of organic waste recycling by establishing a composting programme. [17]

4.3 The Women's Network for Waste Reduction

Aiming to raise awareness and popularize the environmentally responsible lifestyles, the *Women's Network for Waste Reduction* was established by a group of female representatives from 16 organisations in 1997. The group was actively involved in activities such as appealing to citizens not to bring waste into the household, to prolong the life of each product and to purchase reused or recycled goods. This network is actively involved in negotiating with major retail stores in the city to abolish excessive packaging through a food tray ban agreement and monitoring their sales activities on a regular basis. They have already concluded an agreement with four larger retail shops in the city and plastic food trays were prohibited in the sale of 76 items. In addition, the network convinces stores to stop offering disposal shopping bags, distributes reusable shopping bags (my bags) for free to every household in the city, and introduces a point-card system for clients who come with their own shopping bags to do away with using plastic bags for shopping. One of the network's many other activities is environmental education on waste reduction using a picture-story show.

Moreover, the Women's Network has started an Eco-shop Certification System for environmentally conscious stores, especially for the shops that have taken initiatives towards resource conservation, waste reduction and selling and promoting recycling goods. After obtaining the ISO 14001 certification for an environmental protection and management system in 2000, Minamata City established its own *ISO certificate system for schools, families and shops* to raise awareness and popularize environmentally responsible lifestyles among its citizens. It includes a simple evaluation process starting with a declaration to create environmental-friendly lifestyles or business activities,

followed by the applicants identifying some activities that they can do by themselves to achieve environmentally friendly lifestyles, and finally concludes with the applicant submitting the plan of action to the city office. Participants keep track of their activities and after three months, the Women's Network along with some other committee members, such as the Junior Chamber of Commerce, the Board of Education and the Environmental Policy Division of the city evaluates the outcome. Successful applicants obtain a certification from the mayor. At present, all of the 16 elementary and junior high schools and 80 households in the city have received the acknowledgement. Many schools have started an ISO Club and have organised volunteer activities to separate the school's waste into 23 types and bring it to the waste collection stations and to trim flowers at the school. The ISO system was further expanded to tourist hotels and inns in Minamata City, which have declared that they will reduce garbage by establishing their own waste reduction and recycling programmes. For these efforts in revolutionising lifestyles and raising awareness, the women's network has been recognised and was awarded the grand prize at the Municipal Government Environmental Grand Prix 1999 and was also awarded the Genki Waste Grand Prize in 2001, which was organised by the network of non-profit organisations called the Genki Network for Sustainability.

5.0 DISCUSSION AND CONCLUSIONS

This paper is concerned with the effect and actions at the local level, where it is argued that local governing processes is the key to creating more environmentally sustainable cities. As our work in Minamata City has shown, sustainable development cannot be addressed or achieved by a single set of governmental or other decision-makers. The city development strategies that focused only on economic growth and individual pursuit of self-interest coupled with the possibility of using a free-ride position in the forefront of the top-down planning processes can contribute to achieve rapid economic growth in cities. However, it is not always guaranteed that it will help the city to achieve a high quality of life and sustainable living for its citizens. It is therefore essential that the stakeholders, all of whom are polluters in some form, build partnerships and adopt an attitude that is oriented to cooperation rather than to the pursuit of individual interests in working out the solutions, their implementation and the monitoring of results.

To realise this, Minamata City developed a multi-stakeholder processes of consensus building and collaborative decision-making, which goes beyond the traditional practices of city planning and created opportunities where people living in and using a shared space are actively involved in defining the conceptions of sustainability that are relevant to them based on their local know-how and enable them to act responsibly. It goes beyond inviting people to attend the meetings and consulting them to creating space for participants to work together as equals to realise common actions.

It was identified that through such activities, stakeholders can build new relationships, networks and mutual learning which will enable them to develop sustainable solutions for future challenges. However, the ability of diverse actors to engage meaningfully in processes of consensus-building, collaborative decision-making and mutual actions is structured by the institutional capacity to bring the relevant actors together, manage the process of information sharing and consensus-building, and mobilise the resources to implement the decisions taken. The observations have also emphasized the importance of enabling factors such as the presence of active, informed and coordinated civil society groups and strong commitment, responsiveness, and flexibility from within local government (both policy makers and decision makers).

6.0 ACKNOWLEDGEMENTS

The authors greatly acknowledge Mr. Osaki Shinya, Eco Model City Promotion Center, Minamata City, Mr. Kukita Masahiro, Clean Environmental Center, Minamata City, Mr. Masazumi Yoshii, a former Mayor of Minamata City and Mr. Tetsuro Yoshimoto, President, Jimotogaku Network for their valuable information in developing this case study.

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