Analysis of Cross-sectoral Networks in Local Sustainable Development Projects in Japan

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Abstract

In this thesis, cross-sectoral networks among government, industry and citizen sectors in two Japanese local sustainable development projects introduced bioenergy will be analyzed and discussed. The research and analysis focus on the contributions by local cross-sectoral networks in the projects. As a result of case studies, the local cross-sectoral networks showed their strengths in interpretation of sustainable development in their local and sectoral contexts based on their understandings of local economy, environment, society, culture, local problems and assets. The discussion process among the network actors added different values to their activities and increased the importance of the projects among them. Trust among network actors and community vitalization were observed to be important outcomes from their networking processes. In these two cases, local network actors showed considerable potential to play leading roles in planning and implementing sustainable development projects. On the other hand, capacity building among local officials to raise their understanding of sustainable development is increasingly important. Local sustainable development programs in Japan are still in the beginning phase, therefore experiences and studies of cross-sectoral networks in Swedish municipalities and other European countries could be helpful precedents. At the same time, other case studies of cross-sectoral networks remark that embedded risks can arise as the projects proceed. Further study with a long term perspective is necessary.

Keywords

Cross-sectoral Networks, Bioenergy, Sustainable Development, Japan, Localism

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Abbreviations

BDF	Biodiesel Fuel
LA21	Local Agenda 21
SVEBIO	Swedish Bioenergy Association (Svenska Bioenergiföreningen)

1 Introduction

1.1 Problem

Although it has been asserted that the necessity of joint collaboration by actors from different sectors are increasing (Halme and Fadeeva, 2000; Malmborg 2003), efforts of joint collaboration are rarely analyzed. At the same time, it is remarked that the concept of sustainable development proposed in Our Common Future by the World Commission on Environment and Development (the Brundtland Commission) in 1987, was accepted broadly by people from various sectors due to its lack of specific definition, and the vagueness of the concept "allows objectives and goals formulated according to each actor's individual interests" (Hägerhäll and Gooch, 2002; Tonn and MacGregor, 1998). This leads to a variety of initiatives toward sustainability by different sectors of society, which could create chances for different sectors to work together based on the concept of sustainability.

At the same time with that the importance of partnership beyond the boundary of sectors increases, it is now widely accepted that the importance of public participation also increases (Webler, T., Tuler S., et al. 2001). Looking at the case studies of sustainable development initiatives at a regional or local level, partnerships with local actors and involvement of citizens are getting important, and cannot be neglected. McCormick and Kåberger (2005) admit the importance of partnerships with local actors, and Kahn (2004) presents a case of bioenergy project that was hindered by inadequate measures to involve public in both planning and decision-making processes which induced public negative perception to the project. These studies might suggest that ideas for sustainable development need to be accepted by broad groups of people. On the other hand, to gain acceptance and approvals all over those groups makes the planning and decision-making processes more complicated and could cause other problems such as conflict resolution. A need of compromise also suggested (Webler, et al. 2001). Between reality and ideal, a theme of partnerships needs more empirical research from cases of success and failure.

In addition to the points above, this study deals with cases of sustainable development projects utilizing bioenergy. Bioenergy projects are assumed to have the necessity to mobilize more stakeholders for implementation, compared to other renewable energy production systems. Wind and solar energies, for example, need facilities to receive energy sources and convert into electricity such as wind turbines and solar panels, and the stakeholder can be minimized to major energy suppliers and users in institutional levels under a closed and technocratic approach. However, bioenergy sources are usually biological origin, often from agriculture, forestry, households and so on, and need to be collected and transported to a conversion facility (UNDP, 2000). Due to the need of collection, transportation, and processing, it is assumed that more actors will work for it, therefore this implies the need of political or administrative processes of approval, content or agreement from related actors. Building an energy plant needs investment, therefore uncertainties or risks associated with the project could reinforce the importance of planning process through careful communication among actors.

Studies on this topic have already started about European countries (e.g. Fadeeva and Halme, 2001). On the other hand, initiatives toward sustainable development in Japan are less understood, and hardly known by other countries. Therefore, analyses of cross-sectoral networks are even less attempted. Malmborg (2003) notes that research findings from case studies in one country do not

always apply to other cases in other countries, on the other hand, his point also suggests further needs for study of this sort for building theories.

In this paper, two sustainable development projects in Japan will be analyzed and discussed in regard to their cross-sectoral networks. The projects are pioneering cases across the country in bioenergy utilization established by partnerships beyond the boundary of sectors of government, industry, and citizen. As Swedish municipalities have longer history of cross-sectoral collaboration in a regional or local level, Swedish cases will be briefly discussed for comparison with Japanese cases. Findings of this paper could contribute to similar projects in Japan or other countries for sustainable development initiatives in an open and participatory approach by forming cross-sectoral networks.

1.2 Objective and Research Questions

The research objective of this thesis work is to discuss and analyze if and how the local cross-sectoral networks contributed in the on-going cases of local sustainable development projects. In addition, this paper also aims at discovering how driving social factors contributed or enhanced the formation of local networks for sustainable development. Findings of cross-sectoral networks in the two cases will be compared and analyzed.

As a preliminary hypothesis of this study, lack of coordination among key actors is assumed to be a big barrier to implementation of sustainable development projects. In turn, well-organized networks among different actors in regional level are assumed to bring effective coordination among actors in the projects. The biggest interest of this study is; how cross-sectoral networks contribute to planning processes of on-going cases, and identify factors which affect such processes. Putting one keyword for analysis “cross-sectoral networking” here, on-going cases in Japan will be explored.

Research questions of this study are summarized as follows.

- **Why were local networks important in on-going cases of sustainable development projects?**
- **How did local networks contribute to implementation of sustainable development projects?**
- **How were local networks built and maintained?**
- **What were drivers and barriers of building local networks in social/political contexts?**

1.3 Scope

The geographic boundary of the study is within each of two towns in Japan, Aito Town in Shiga Prefecture[1] and Kuzumaki Town in Iwate Prefecture. However, Prefectural government are also influential actors in the projects, therefore two prefectures will be also mentioned depending on the relevance in this paper. The analyses of these two cases will be discussed based on historical and socio-economic backgrounds of the projects, and discussion will be developed to general political relationships between local and national governments because it influences the activities by local networks, however, environmental policies in national level is out of the scope and mentioned as

[1] Aito Town is now merged to Higashi-Omi City, however throughout the history of bioenergy project, this town played very important role. Therefore, the town will be mentioned with the former name in this paper.

external factors influencing the local projects. Discussion on the relationships between central and local governments will be limited to the relevant aspects affecting the formation of local political actions by central government toward the project discussed and its networks.

Secondly, analytical boundary of this study is expressed in a mental model (figure 1-1) within the range of the planning process of each project from available options to narrowing down to actions implemented. The focus of this study is on interaction between key actors and their contributions, especially based on their understanding of local politics, economics, society/culture, environment and citizen participation. Accordingly, evaluation of outcomes from each project is out of the research boundary in this paper, i.e., social, economic, and environmental contributions to the communities by the projects will not be discussed in detail.

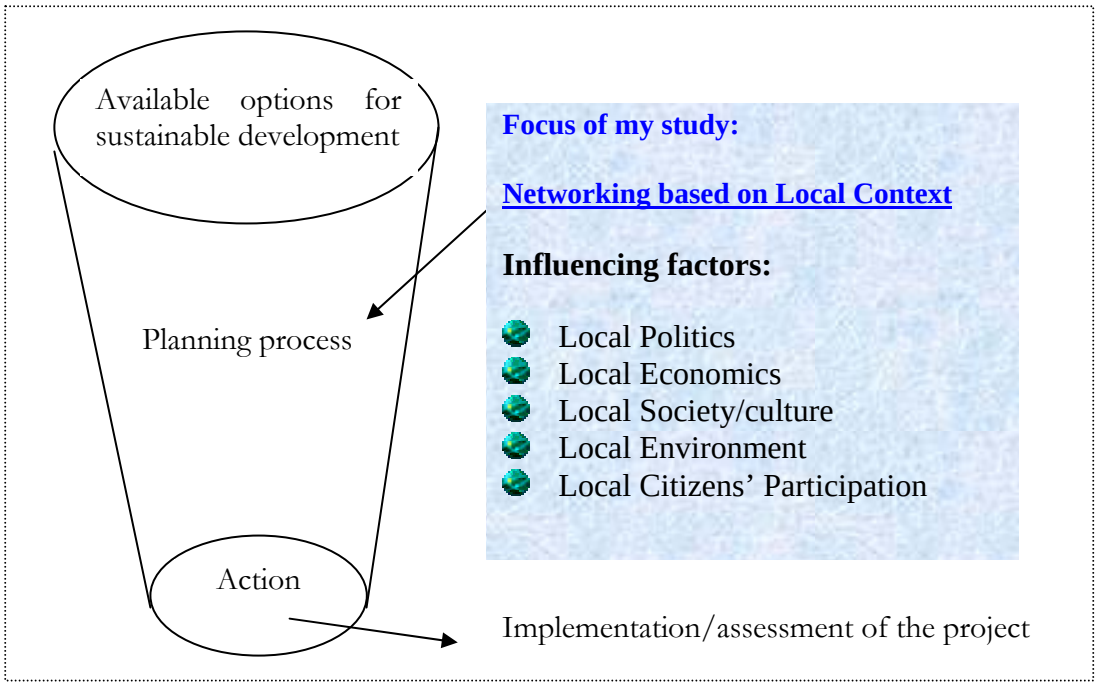

Figure 1-1 Mental Model: Scope of this study

1.4 Methods and Materials

As the research aim is to discuss and analyze if and how the local cross-sectoral networks contributed in the on-going cases of local sustainable development projects, qualitative analysis from case study approach is taken in this paper.

Cases of Japan was chosen on the ground that Japan is a developed country known for its technological capacity, however, sustainable development projects in local level are not implemented as much as Sweden for example, taking Local Agenda 21 for an indicator, (elaborated in Chapter 5). In spite that available options for sustainable development are technically or widely available, more projects could be implemented. To promote more initiatives for sustainable development, effective planning process is assumed to be important because the planning process can bridge between available options for sustainability and implementation of actions as shown in figure 1-1 in previous section. Choice of Japan could imply that technological capacity might not always lead to the implementation of sustainable development projects. And cross-sectoral

networks will be discussed in this paper to find out if the networks bridges available options to implementation of actions effectively. Studying about what kind of drivers and barriers between available options and actions in a country with technological capacity would be worthwhile to look at.

Targeted cases in this study are the towns which have implemented local sustainable development projects in Japan, especially known as pioneering cases in bioenergy utilization. Two cases will be discussed based on an assumption that cross-sectoral networks in the cases and factors affecting their formations could be different. For this reason, comparative approach is taken to gain either similar or deviating findings. The selection criteria are “pioneer” and “bioenergy”. Although the cases in this study are engaged in different activities, pioneering cases were assumed to have got through learning processes carefully rather than other cases which followed with existing successful cases. Looking at the aspect of bioenergy is also important. Compared to other renewable energy systems such as solar and wind energy, bioenergy is assumed to need more actors because the energy sources are organic matters and come from agricultural and forestry sectors in the two cases. This implies that bioenergy cases would need more actors than other renewable energy sources.

Case studies were conducted for qualitative analysis. Necessary information was collected from primary and secondary data. Primary data was semi-structured and open-ended interviews with 10 interviewees altogether from two projects who are project leaders, coordinators, and individuals contributing to the projects. As there were no previous scientific studiesof the two cases, secondary data source were interviewees’ own publications, websites, official documents and brochures released by town halls. The collected secondary data were used for describing background and activities of the cases in Chapter 2 and 3. Interviewees were chosen while collecting basic information about the projects. Key organizations for the projects were identified through information collection about the cases, and key actors who could be interviewees were identified. Interviews were conducted from 1 to 4 hours. To gain individual perception and motivations toward the projects and grasp the whole figure of relationships or partnership among actors for analysis (Kvale, 1997; 30), interviews were conducted in a semi-structured and open-ended way. For this purpose, interview objectives were designed, on the other hand, questionnaires had to be designed not to lead interviewees to certain answers what interviewer expected. Therefore, interviewees’ own description is regarded to be important for analysis. Although site visits were conducted to observe the sustainable development projects themselves, the findings of this study came from interview results. Based on interview results, conceptual maps about interaction among sectors were created into mental models shown in chapter 2 and 3 for better understanding of contributions by each sector, and analysis in this paper is based on the interview results.

The topic of this study is relatively new. To seek for analytical tool, related case studies in European countries dealing with cross-sectoral collaboration and public-private partnerships (e.g. Fadeeva, 2003) were referred to develop analysis part of the thesis. As the research revealed that the two projects are deeply rooted to local society, economy, environment and culture, review of literatures on localism was attempted for theoretical support. As the topic is also related to adopting idea among actors, diffusion theory (Rogers, 1995) is also used as an analytical tool.

Local cross-sectoral networks could be affected by factors such as political structure, policies for sustainable development, and cultures of the country. Therefore, the two cases in this study were compared to other countries cases to develop discussion part of this thesis. For comparison, Sweden is chosen because of its strong local autonomy which could be favourable effects on local cross-

sectoral networks. Local Agenda 21 (LA21) is used as an indicator to compare local initiatives on sustainable development between Sweden and Japan. Case studies and literatures on LA21 were reviewed for this purpose.

Informal discussion with Jamil Kahn, a researcher of local politics in regard to renewable energy in Sweden, helped general understanding of Swedish governance system by local governments regarding environmental protection and their scope of responsibilities. In addition, an interview with Lennart Ljungblom, one of the co-founder of Swedish Bioenergy Association helped understanding of cross-sectoral networking and network formation in particular.

1.5 Limitations

The limitation of this paper is that a set of direct interviews and e-mail exchange could not cover all of the actors in the projects. It should be also noted that this also implies the risks of biased answer from interviewees, for example, own their views on other actors' contributions to the projects. To avoid this risk, statement from interviewees should be analyze by triangulation (Yin, 2002), however, limited number of interviewees, this triangulation could not be conducted sometimes. To supplement the lack of direct interviews, secondary data source such as websites of interview record, brochures, town newspaper articles, and their publications were collected.

In addition, as this paper deals with two case studies, therefore the finding will not always generalize problems within all the existing cross-sectoral networks in Japan or other countries. Or rather this study could be one of the accumulated studies to generate solid scientific theory in the field of cross-sectoral networks to contribute to sustainable development.

1.6 Terms in this Paper

In case studies analyzing interaction among related actors toward sustainable development, several different terms are seen such as public private partnerships, multistakeholder collaboration, etc. In this paper, related actors are categorized in three sectors: government, industry and citizen. Due to this categorization, this thesis chooses the term "cross-sectoral network".

For a key phrase of this paper, cross-sectoral network for sustainable development, Fadeeva (2003) made a definition as "a voluntary initiative of public-private stakeholders that come together to combine their individual resources and expertise in a pursuit to collaboratively address issues of sustainable development". She further tries to wrap up the characteristics of the term, and describes the characteristics of cross-sectoral networks aiming at sustainability that "[t]he goals of sustainability networks are not always clear, boundaries of networks are not sharply defined, and the authority of one actor over another is weak" (2003b). In this paper, cross-sectoral networks refer to the group of actors from various sectors aiming at sustainability, however those actors do not necessarily form a coalition group. Some actors work together to realize their ideas, and other actors contribute to the local sustainable development individually through their own activities adopting ideas of the projects. As a result all their activities contribute to the common purpose of the communities, therefore actors contributing the project individually are also regarded as a part of network. In this paper, cross-sectoral network means a constellation of actors which contribute to the sustainable development of the communities, and do not matter if they form working groups or not.

1.7 Structure of the Paper

In this chapter, background, research aim, methodology, and theoretical framework of my study are presented. In chapter 2 and 3, historical background and network structure of my case studies will be outlined. With the following chapter 4, drivers and barriers in regard to forming/maintaining local networks in two cases will be analyzed, and the problems in line with local/national political climate in Japan will be discussed. In chapter 5, possibilities to enhance local sustainable development programs by local actors will be explored by comparison with Swedish systems. And potential problems and possibilities of local cross-sectoral networks will be discussed with literatures of case studies of other countries. Findings from case studies in this paper, and results from discussion will be wrapped up in chapter 6.

2 Case Study 1: Canola Flower Project

Canola Flower Project started in Aito Town, Shiga Prefecture located in the central Japan (see figure 2-1, 2-2). The project, originating with an initiative to restore a local lake from pollution, suggests one vision of sustainable community by utilizing canola as a biomass resource. In this project, canola is planted and harvested from rice fields which become idle in winter. Canola oil is extracted from the harvest, and used as cooking oil by households. Canola residue after extracting is used as organic fertilizer, fodders, etc. Canola cooking oil waste is collected and processed into biodiesel fuel (BDF) and used as a fuel for local official vehicles, tractors, and ships. This project suggests many elements for sustainable development: recycling, renewable energy use from biomass, organic farming, food production, etc. Moreover, the beauty of canola flower blossoming in every spring is becoming an tourists' attraction. This initiative is well received across the country because the model for sustainable development can be applicable to other local communities in Japan. Canola Flower Project attracts attention from municipalities across the country as one of the most progressive cases for local sustainable development. In this chapter, background history of this project will be described based on secondary data, and interaction among each sector, government, industry and citizen will be discussed.

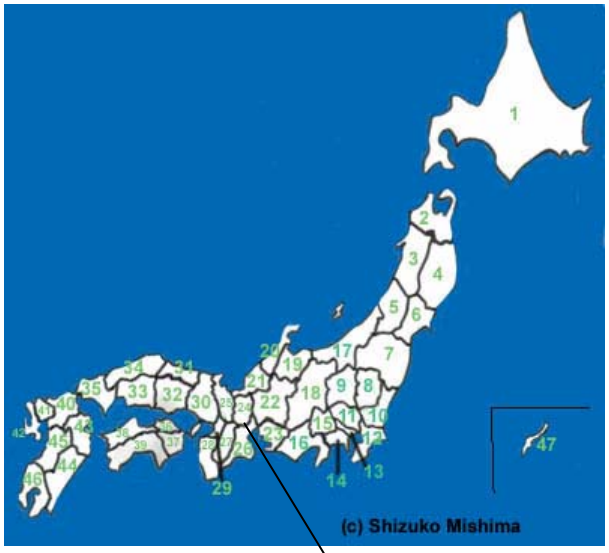

Figure 2-1 Location of Shiga Prefecture in Japan

Figure 2-2 Map of Shiga Prefecture

2.1 Historical Background

Lake Biwa, the biggest lake in Japan, experienced the red tide with an unprecedented scale from eutrophication in 1977. Research showed that one of the reasons for the eutrophication was phosphorus in synthetic detergents which were broadly used by households around the lake. As synthetic detergents at that time contained phosphorus and soaps didn't, local citizen activists around the lake started up a campaign for soap use. At the same time, a method to process into soaps from used cooking oil was introduced, and thus an initiative of used oil collection from household started. This campaign caused conflicts of interests and resistance by the detergent industry. The campaign saw a temporary success, however as soon as the detergent industry

released non-phosphorus detergent, the former soap users turned to this non-phosphorus detergent and the campaign started to decline. The framework of used cooking oil collection was already established, therefore large amount of collected oil remained unprocessed. As the collected oil is volatile substance, activists received a warning from a local fire station. This initiative came to a dead end.

In 1992, they found a case in Germany which uses canola oil for processing into biodiesel fuel. In 1993, Industrial Research Center of Shiga Prefecture succeeded in BDF processing from used cooking oil at its laboratory. After receiving the good result of testing the BDF for cars, ships and tractors, they launched on developing a pilot plant. As activists faced difficulty of financing, they needed subsidies either from either central or municipality government. The system in Japan can subsidize projects by local governments, not individual project by citizen, therefore they sought for local community they could work with, and found Aito Town (now Higashi-omi City) as their partner. In 1995, BDF processing plant was developed successfully and installed in the town.

After the success of BDF plant using cooking oil, they faced the shortage of cooking oil for fuels. Then, they came up with an idea to cultivate canola at idle fields of rice from the fact that self-sufficiency rate of vegetable oil in Japan was very low (4% as of fiscal 2003)[2]. In addition to a source for cooking oil, canola has been cooked as a spring vegetable in Japan. Activists integrated several different values to their activity such as: 1) produce fuel energy from local agriculture, 2) locally-produced canola oil, not depending on imported one 3) revitalization of local agriculture. And thus the vision of sustainable town was designed with growing canola and utilizing it in various ways such as vegetable, cooking oil, organic fertilizers, fodders and finally to BDF (shown in Figure 2-3). In 1998, Canola Flower Project launched in Aito Town (now submerged to Higashi-omi City). Through the campaign at one of the Earth Day events in 1999, this project started to expand nationwide, and Canola Summit, held in 2000, gathered participants from all over the country. In 2001, Canola Flower Project Network was established to expand this initiative nationwide through collaboration with other municipalities across the country. In 2005, a community museum called Nano-hana Kan opened with a facility to extract canola oil and a BDF plant, and functions as a recycling station for municipal wastes, a shop of environmentally-friendly products such as soap, detergent, toilet paper from recycled paper, etc as well as a museum to exhibit initiatives local sustainable development with the Canola Flower Project.

1977	Biggest red tide observed at Lake Biwa	1995	Pilot plant for BDF developed
1978	Collecting used cooking oil for soap use campaign started	1996	Prototype of BDF processing machine installed in Aito Town
1980	Non-phosphorus synthesized detergents released	1998	Canola Flower Project launched
	→ Decline of collecting used cooking oil for soap use campaign	1999	Canola Flower Project was taken as an Earth Day event.
1989	Environment Co-op was established	2000	Nationwide Canola Summit was held
1992	Encounter with BDF from canola oil in Germany	2001	Canola Flower Project Network was established
1993	Processing BDF from used cooking oil succeeded	2005	Nano-hana Kan (Canola Museum) opened

Table 2-1 History of Canola Flower Project

[2] Data source is the report of food self-sufficiency rate by the Ministry of Agriculture Forestry and Fisheries of Japan as of fiscal year 2003 (from April to March)

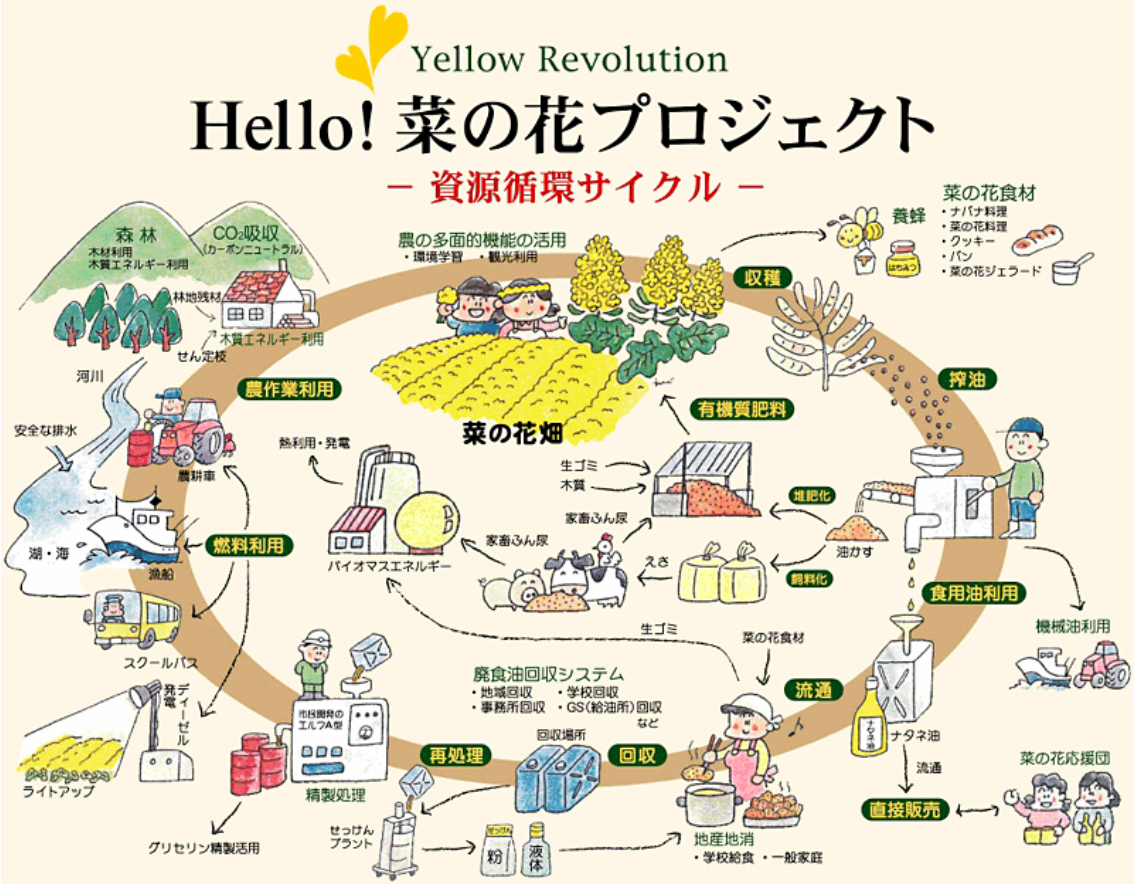

Figure 2-3 Design of sustainable town with canola flower project

2.2 Networking of the project

From the background history of the project, conceptual map were created in a mental model to express the simplified interaction among three categorized sectors; government, industry and citizen, and table 2-2 summarizes contribution from each sector. Further detail on each actor's contribution is elaborated in table 2-3. Through the history of the Canola Flower Project described in the previous section, citizen activists played a leading role as facilitators. Facilitators from citizen sector made all the necessary coordination and arrangements for the project by gaining necessary supports from all the sectors described in table 2-2, from planning, financing, arranging technical problem solving, gaining agreements to implement their project, finding the places to grow canola flowers and to gather necessary volunteers to harvest canola seeds.

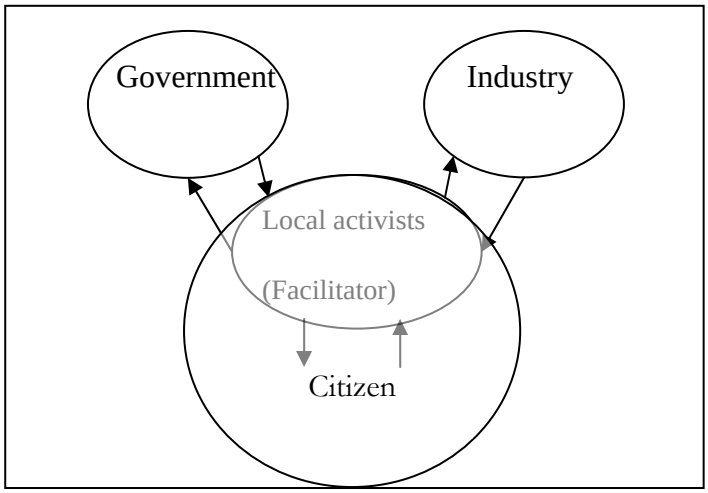

Figure 2-4: Observed Relationships/interactions of key actors in Canola Flower Project

Government	Political support * legitimacy of the project Technical support Financial support Institutional user
Industry	Technical support Provide places to grow canola Institutional user
Citizen	Practical support *collection of resources

Table 2-2: Contribution to the project by each sector

Sector	Actor	Function
Government		
-Local	Aito Town Hall (now Higashi-Omi City Hall)	Accepted to have BDF test plant Subsidized to the development of BDF pilot plant Introduce BDF to official vehicles
	Industrial Research Center of Shiga Prefecture	Development and customization of BDF pilot plant
-National	Environmental Agency (now Ministry of the Environment)	Political advice to the project
	New Energy and Industrial Technology Development Organization	Subsidize installment of BDF plant
Industry		
	Aburato Shoji	Local gas station
	Local farmers	Provide idling rice field to plant canola
	Local fishers	Test BDF with their ships

Citizen	ELF Ltd.[3]	Deal with BDF plants and environmental friendly products
	Environment Co-op	Planning future vision for sustainable development
	Volunteers	Collecting used cooking oil, planting & harvesting canola
	Canola Flower Project Network	Diffuse canola flower project nationwide

Table 2-3: Key actors in Canola Flower Project

Table 2-3 lists key actors in the project categorized in three sectors: government, industry and citizen.

Government sector here consists of national/local governments and government-affiliated organizations. Both national and local governments advised the project facilitator in procedure of subsidies application offered by National government-affiliated organization. Local government also supports the Canola Flower Project facilitating communication between the central government and local activists. Local government-affiliated organization played important role to develop and customize the biodiesel plant to process cooking oil into biodiesel fuel. And local government provided political support, or legitimacy to the project, and became one of the institutional users by introducing biodiesel fuel to the government's official vehicles from canola oil.

Industrial sector in this project is from local farmers, fishers, and a local gas station. Local rice farmer provided their rice fields after harvesting rice in autumn every year allowing the project participants to grow canola flowers until they start to grow rice again in spring. Local fishers helped the activists in testing biodiesel fuel to their ships. A local gas station associated itself to the project in selling biodiesel fuel and collecting used cooking oil as well as recyclable wastes, and uses powder soap derived of waste cooking oil for car wash.

Citizen sector played the most important role in this project from planning to implementation. Members who formed Environment Co-op started use soap campaign and have long history as environmental activists and advocated the importance of environmental protection and how to make changes from household, industry, government and to other Asian countries. Supporters among citizens provide necessary volunteer labour to collect waste cooking oil, and to plant and harvest canola by combining the activities with education opportunity toward local school children. Citizen also becomes users of biodiesel oil, and customers of environmentally-benign products produced by facilitating organization to support the project financially.

Facilitating organization, derived from citizen sector, plays the most important role in the cross-sectoral network for the Canola Flower Project. Ayako Fujii, Representative of Canola Flower Project Network, is the key activist to form the local network toward sustainable development and coordinate necessary steps for implementation with other key actors from the very beginning. She and her citizen organization have build a connection among different actors including both local and national governments, academics and industries to solve financial, political and technical problems to push their efforts forward. Fortunately, Fujii already built a personal network with

[3] Under Consumer Cooperative Law, Environment Co-op is not allowed to deal with its products beyond the jurisdiction where it locates. To respond growing interests to its products and BDF plants, ELF Ltd was established as a private company invested by Environment Co-op. (Source: Environment Co-op

individuals who could be the key actors and supporters for the project. She utilized her own network fully and expanded continuously. For transition to biodiesel fuels, building a pilot plant for processing for example, required technological development and financial investment with uncertainties and risks. Continuous approach and her reputation worked very well to get over these uncertainties, risks and unwillingness by the actors indispensable in the development and investment such as local and national governments which could offer some subsidies for development and local industrial technology center.

The idea of sustainability was innovation to local people which is “an idea, practice or object that is perceived as new by an individual or other unit of adoption”. (Rogers, 1995; 20). From that Fujii’s role was influencing other local people to diffuse the idea of sustainability embedded in the Canola Flower Project, she could be categorized as an opinion leader according to Rogers. (Rogers, 1995; 27), and her opinion leadership worked effectively to the project to involve other actors and more participants to the project. According to other interviewees, she is very competent in communication with people, even charismatic.

On the other hand, fragility of the network was observed due to her charisma because the relationship and partnership with other actors have been sustained only by her active and continuous approaches. “If I did not ask for participation by other local communities continuously, they would stop this initiative sooner or later” (Fujii, 2005). Her personal network and long experiences working on local environmental issues were very effective in establishing a network for the project, however this is problematic in maintaining the network. Fujii’s colleague, Yamada asserted in the interview, “these approaches are only effective and have to be from her”. This would cause heavy workload concentration to her. In the long term, the network will be difficult to sustain. To sustain the network and project, continuous efforts to keep in touch with actors in the network and outreach for potential actors to increase people who will understand, accept and join the project.

3 Case study 2: Kuzumaki Town

Kuzumaki Town in Iwate Prefecture locates in the northern part of Japan (see figure 3-1 and 3-2), and its main industry are dairy farming and tourism. In addition to dairy products more than enough for town residents, the town expanded its scope of aim from locally-produced food to locally produced energy. The town keeps strong relationship with Iwate Prefectural government which the governor shows strong leadership toward sustainable development. Inspired by Vaxjö City in Sweden and Denmark with their renewable energy systems, the town highlighted renewable energy production as one of the main town policies, and introduced wind turbines, solar panels, biogas plant and pellet stoves. Biogas plant was installed in the biggest dairy farm in the town to cope with excrements and food wastes from the farm and restaurant nearby. As the local forest company has continued pellet production since 1980s, the local actors are very active on promotion in woody biomass utilization. Now, Kuzumaki Town is known as one of pioneering town in renewable energy production and its well coordination with existing local industries. In this chapter, background history of this project will be described based on secondary data, and interaction among each sector, government, industry and citizen will be discussed.

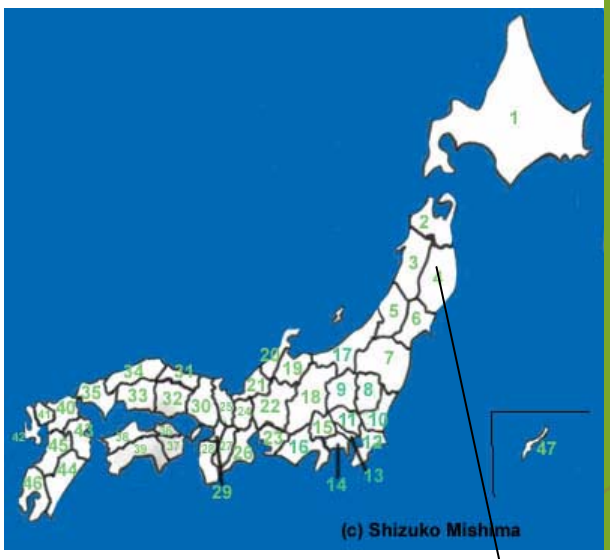

Figure 3-1 Map of Iwate Prefecture in Japan

Figure 3-2 Map of Kuzumaki Town in Iwate Prefecture

3.1 Historical background

Kuzumaki Town in Iwate Prefecture has succeeded in dairy farming and continued working on further town development. The Town started to work toward sustainable development under the influence of Iwate Prefectural government. As interests in renewable energy increased since the

Kyoto Conference on global warming in 1997, Iwate Prefectural Governor declared a policy direction toward sustainable development. This policy was stimulated through the exchange with a Swedish municipality and an organization, Vaxjö City and Swedish Bioenergy Association (SVEBIO). Kuzumaki town councillors and local forestry industry representatives visited Denmark and Sweden to learn renewable energy, and their ambition for introducing renewable energy became even stronger. After studying from experiences from Nordic countries, Kuzumaki Town formulated renewable energy vision as one of the earliest community in Japan in 1999[4] and installed wind turbines and solar panels.

Fortunately, Kuzumaki town has rich biomass resources. As the town's main industry is dairy farming, vast amount of excrements are being generated. Kuzumaki town installed methane gas production plant and also started experiment to generate electricity from the biogas. The town also has rich forest resources and local forestry company, Kuzumaki Forestry Co. has started pellet production since 1981. Local swimming pool introduced a pellet boiler in 1984 and local forestry museum in 1988 with the concern over future oil supply experienced in 1970s. However, after oil supply stabilized, the idea of woody biomass utilization had become neglected. As domestic forestry industry is shrinking overall (Sakamoto 2005; 2004), local forestry industry had been desperately seeking for a breakthrough.

When global warming and carbon dioxide emissions issues came arise, neglected pellet use gathered attention once again because pellet use is effective way to utilizing wastes from forestry work such as sawmill dust and heat energy source which can neutralize carbon dioxide emissions. Taking it as a chance for recovery of domestic forestry, local forestry industry and local government officials formed a study group, Woody Biomass Iwate, and worked to apply ideas learned from Sweden and Denmark to promote wood biomass use through studying local problems, needs, assets and limitations with members of the group, other local people and external experts.

Under the leadership of Prefectural Governor, the Iwate Industrial Research Institute started to develop pellet stoves collaborating with manufacturers of heating equipments. The institute developed several models of pellet stove suitable for quality of pellets produced in the region. The model of Iwate Pellet Stove was one of them utilizing Nanbu-Tetsu, (Nanbu ironcraft), the local cultural asset since 17th century. The development of Iwate Pellet Stove was a challenge to combine woody waste management, protection of local industry especially forestry and add values of locality.

Initiatives by Iwate Prefecture and Kuzumaki Town now receive attentions as one of pioneers in promotion of wood biomass use. Woody Biomass Iwate and local governments are very active in diffusing the idea across the country. The group held a nationwide event called Woody Biomass Summit in Iwate in 2004 inviting guests from Vaxjö City and mayors of other prefectures. In addition to expanding promotion activities of wood biomass use across the country by Kuzumaki and Iwate, awareness about environment and sustainable development grows within Kuzumaki Town. Therefore several different citizen groups were formed with different interests from various aspects of environmental issues, and internal network actors of Kuzumaki Town started to be diversified under the integrated future vision toward sustainable development of the town.

[4] According to Kuzumaki Town Mayor, Tetsuo Nakamura, 27 percent of Japanese municipalities formulated their own renewable energy visiohns at the time of Kuzumaki's energy vision. As of 2004, this figure still remained 27 percent.

1981	Kuzumaki Wood Works started pellet production	2000	Woody Biomass Iwate founded
1984	Hanamaki Swimming Pool introduced pellet boiler	2000-2003	Exchange between Vaxjo City and Iwate Prefecture
1988	Forest House Woody introduced pellet boiler	2001-2003	Prototype of Iwate Pellet Stove developed/customized
1999	Kent Nystrom from SVEBIO visited Iwate	2003	Pilot biogas plant introduced at Kuzumaki Kogen Bokujo
	Kuzumaki Town Renewable Energy Declaration		Pellet boiler introduced local nursery home (At Home Kuzumaki)
2000	Local forestry industry made study visit to Vaxjo	2004	Woody Biomass Summit in Iwate was held

Table 3-1: History of bioenergy project in Kuzumaki Town

3.2 Networking of the Project

Conceptual mental model (figure 3-3) and table 3-2 and 3-3 were made from background history and secondary data. Compared to the previous case, figure 3-4 shows that general actors in this project have less clear distinction of sectors, which expresses local government officials or local industry workers work together as citizens in that area beyond their social status and limitation. Active individuals from local government, industry and citizen join to the study groups which function as facilitator organizations. Table 3-5 is a simple categorization of contributions from each sector. Table 3-6 is the detailed contributions from each actor.

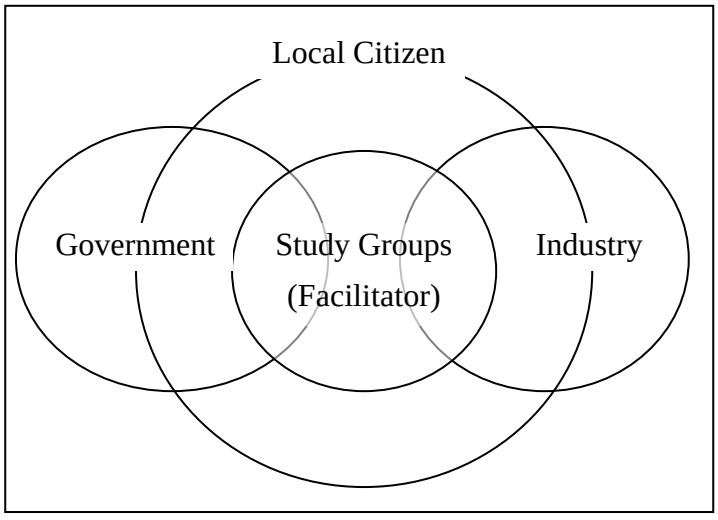

Figure 3-3: Observed Relationships/interactions of key actors in Kuzumaki Town

Government	Leadership to renewable energy * legitimacy of the project Technical support Financial support Institutional user
Industry	Technical support Provide biomass resources Institutional user
Citizen	Support renewable energy policy individual involvement

Table 3-2: Contribution to the project by each sector

Sector	Actor	Function
Government		

-Local	Kuzumaki Town Hall	Formulated Kuzumaki Renewable Energy Vision Promotion of renewable energy (solar, wind and biomass) Institutional user of pellet stove (at town hall)
	Iwate Prefectural Government	Give the project legitimacy with governor's policy toward sustainable Development
	Iwate Industrial Research Institute	Development of Iwate Pellet Stove
-National	New Energy and Industrial Technology Development Organization (NEDO) [5]	subsidize installment of bioenergy facilities (pellet boiler, biogas plant)
Industry	Kuzumaki Wood Works	Production of pellets
	Kanazawa Forestry	Promotion of woody biomass
	Kuzumaki Kogen Bokujo (cattle farm)	Provider of biomass resources (food waste, livestock excreta)
	Sunpot Co. Ltd., Ishimura Industry Co.	Co-developer and dealer of pellet stove
	Hanamaki Swimming Pool	Institutional user of pellet boiler
	At Home Kuzumaki	Institutional user of pellet boiler and solar panels
Citizen		
	Woody Biomass Iwate	Study to formulate/plan future vision with wood biomass utilization
	River Reaches ECO System, Iwate	Study to formulate/plan future vision for sustainability with local contexts of Iwate Prefecture
	Kuzumaki Environment Partnership Naasu	Study group to combat global warming
	Forest and Wind Eco-School	Environmental education to local

[5] New Energy and Industrial Technology Development Organization (NEDO), former extra-governmental organization affiliated with the Ministry of Economy, Trade and Industry, is now an independent administrative institution. Further information about this organization is available at www.nedo.go.jp/english/index.html

	children and visitors across the country
Junior and elementary schools	Introduction of solar panels, environmental education to the entire residents through children

Table 3-3: Key actors in bioenergy project in Kuzumaki Town

Government sector, Kuzumaki Town Hall, Iwate Prefectural Government and affiliated industrial research institute of Iwate Prefecture, played very active roles in the project. Kuzumaki Town Mayor and Iwate Prefectural Governor showed very strong leadership toward sustainable development and renewable energy introduction. And key government officials both in the Town Hall and Prefectural Government worked as a core member of local citizen groups and tried to communicate local key actors in industry and citizen sectors.

Industrial sector consists of local forestry companies, local cattle farm, and residential heating system manufacturers/suppliers had collaborative works with local government sector, and played very important roles in providing biomass resources such as livestock excreta for biogas production and pellet production/supply to users of pellet stoves. These actors from industrial sector are generally very active in the project in two purposes; to add values to their business activity by contribution to local bioenergy project and vitalize their business activities, expansion, and profit increase. They were observed to be very successful in internalizing their understanding of the value of sustainable development in their business context, and actively working on further outreach to diffuse their idea to other local municipalities. A nursery home in the town, At Home Kuzumaki, accepted the Kuzumaki's energy policy, and became institutional user of renewable energy, pellet boilers and solar panels to assimilate local policy and culture.

Citizen sector in this project started from collaborative study group, Woody Biomass Iwate, among governmental and industrial sector to promote woody biomass use, and core actors of the group have meetings after their daily works. Through their study, core actors started to expand their activities broader and formed different citizen groups such as River Reaches Eco System Iwate and Kuzumaki Environment Partnership Naasu, the former group is very active in exchange idea within Iwate citizens to formulate future visions of sustainable Iwate Prefecture through exchanging idea with local citizens and other municipalities, and the latter group focuses on planning countermeasures against global warming, such as carbon dioxide emission reduction. It is notable that the core members of renewable energy promotion from governmental and industrial sectors established these citizen groups, and work with two or three of them at the same time. At the same time, Kuzumaki residents, citizen groups, and governmental and industrial core actors started to work on outreach to younger generation. By installing solar panels to local schools, local schools launched environmental education to local primary and junior high school students. One of the interviewees, an official of Kuzumaki Town Hall, asserted that the environmental education to children was very effective in educating their parents as well by giving them good reason to be a role model as environmentally considerate adults. Kuzumaki residents also started Forest and Wind Eco-School remodelled from old and closed school for environmental education to children nationwide. The school now has many visiting children for their environmental summer school across the country.

Integration of Top-down and Bottom-up Approach

Kuzumaki Town's case shows two features influencing the formation of cross-sectoral networks for the town's initiative to introduce renewable energy as follows:

- Both Kuzumaki Town Mayor and Iwate Prefectural Governor show strong leadership in their policy direction toward sustainable development
- Influential local government officials both from Iwate Prefectural government and Kuzumaki Town Hall commit themselves in working as core members of citizen groups.

These two things make interesting integration of both top-down and bottom-up approaches and contribute to formation of cross-sectoral network. Declared policy direction toward sustainable development gave legitimacy to form organizations for that purpose. Top-down approach of Iwate Prefecture and Kuzumaki Town did not remain to a closed and technocratic planning process in the proceedings of the project. Blessed with active local officials get involved to citizen groups, both of local governments establish connections with industry and citizen sectors for open discussions. Specificly, senior policy director of Iwate Prefecture, showed his foresight and acceptance to innovation by establishing a partnership with local industry. Particularly, this was observed to be very important because the practical steps are dealt by local officials even if there is a strong leadership by a governor or mayor. One of founders of Woody Biomass Iwate from local forestry industry, Yasuhito Endo, remarked that he would not get involved in the woody biomass promotion initiative without an offer for partnership from the senior policy director. Therefore, in addition to legitimacy given by the head of local government, active involvement by local officials with industry and citizen sectors contributed to formation of cross-sectoral network in this case.

Coffee Break

In addition to practices of renewable energy introduction to the local community, the actors of Kuzumaki Town and Iwate Prefecture learned an important insight from Vaxjö City Mayor, Carl-Olof Bengtsson in regard to form a cross-sectoral network and partnership. According to the interviewees of this research, they clearly remember an answer from Bengtsson to a question about a tip for establishing a partnership with different actors. According to interviewees (Shimotenma; Endo; 2005) the city mayor replied, "have a coffee break", and repeatedly emphasized its importance. Interviewees in the town were impressed, and interpreted this answer as creating an open, free and relaxed atmosphere to discuss. Why coffee break, instead of meeting? Because it would be difficult to speak out their own views beyond their official and social roles such as representative of a company or local government, etc, in an official and formal setting. Instead of rigid formality, casual and informal gatherings emphasize the importance of discussion as a local citizen beyond a social role. The idea of coffee break suited the local culture, and it worked very well in creating opportunities for productive brainstorming and discussions.

Integration of Entrepreneurship, Local Governance, and Sustainable Development

Tetsuo Nakamura, Kuzumaki Town Mayor, tries to integrate entrepreneurship and town governance into sustainable development, and expects to achieve this through strong partnerships brought from cross-sectoral network (B-LIFE 21, 2004). Starting of sustainable development project by Kuzumaki Town derived from perception of economic concern for the future. Kuzumaki Town has been very successful in dairy farming, on the other hand, local forestry has been facing difficulties due to the overall decline of forestry industry in Japan since the end of Second World War under the tough price competition with imported timbers (Sakamoto 2005; 2004) As for the finance of the town, municipalities in Japan generally receives huge amount of tax revenues allocated from the

central government, and Kuzumaki Town is one of them as well[6]. Therefore the budget of town management is largely dependent on the allocation from the central government. Kuzumaki Town Mayor perceived this financial situation to be problematic for the future prospecting the decline of tax revenues nationwide as an expected future trend, and strives for economic independence of the town by protecting successful industry of dairy farming, and also aims at a breakthrough of local forestry industry's revival by promoting woody biomass. With the existing financial framework, the town cannot be economically independent. Therefore, the town seeks for a breakthrough from partnership with industry to gain investment for bioenergy facilities for further profit both from biomass energy production and cost saving of organic waste disposal. Among all the municipalities in the same financial dependence on the central government, Kuzumaki Town Mayor's perception of the situation is observed to be quite progressive in respect to town management.

[6] According to the data from Kuzumaki Town Hall, allocated tax revenue provided from central government consists of 53.6% in 2000, 50.4% in 2001, and 47.8% in 2002 of the total budget of the town. Total amount of fund allocated from central government is in declining trend. (Source: Kuzumaki Town Hall, www.town.kuzumaki.iwate.jp/e/02.htm)

4 Analysis

As described in Chapter 2 and 3, different actors from different sectors provide various contributions to the Canola Flower Project and Kuzumaki Town renewable energy projects. Regardless of their different local environment, economy, society and culture, a certain pattern in networking process was observed. In this chapter, the networking process observed from these two cases will be presented, strengths and weaknesses of the networks will be analyzed and barriers to the networking systems will be problematized to be discussed in the following chapter.

4.1 Networking Process in the Projects

From historical background and interview results, factors influenced their motivation to the projects were identified by the author. After identifying those factors, linking factors of their motivation and outcomes were attempted based on an idea of system thinking. As a result, conceptual model of figure 4-1 was made showing a cycle of the networking process in the Canola Flower Project and initiatives of Kuzumaki Town. The starting point of the two projects came from actors' perception of a crisis at the local level, from local society/culture, economy and environment. Canola Flower Project started from environmental degradation of a local lake, and Kuzumaki Town's case started from economic reasons, protection of local economy and industry. Once people in any sector perceived the crisis, it raised awareness about local issues. The awareness nurtured deeper understandings in causal relationships of the crisis from environmental, economic or social aspects. Seeking for solutions, their understandings developed into consideration on sustainability. Thus, they started to interpret the concept of sustainability based on their own contexts from government, industry and citizen sectors' points of views. While their interpretations of sustainability went on, they gradually started to gather. That was how their network formation began, and they became network actors. They exchanged ideas each other and shared their understandings of local problems to improve and assets to protect. The process of exchanging their ideas through brainstorming was followed by idea modification to local needs and led to value-sharing among other actors.

The phase of exchange of ideas for planning was observed to be the most important process. The actors in the network internalized the idea why the project was important to their local communities through continuous communication with other actors. Value-sharing among actors from government, industry and citizen helped to prioritize their project in the towns, and influenced decision-makers of the local government. The phase of exchanging ideas and planning took a long time in both projects, and one of its outcomes other than project itself was trust among actors. Throughout planning process to implementation of the project, the network group continued monitoring and assessing the planning process, coordination with other actors, methods, etc. Through monitoring, they found their achievements during the on-going process and future tasks, and started to exchange ideas again. These processes are observed to be cyclic as shown in Figure 4-1. Their efforts and progress in the projects gave confidence to network actors and motivation to actions reinforced with recognition by non-participants. Non-participants in the initial networking phase started to have awareness about local issues inspired by the projects, and some of them joined to the networks.

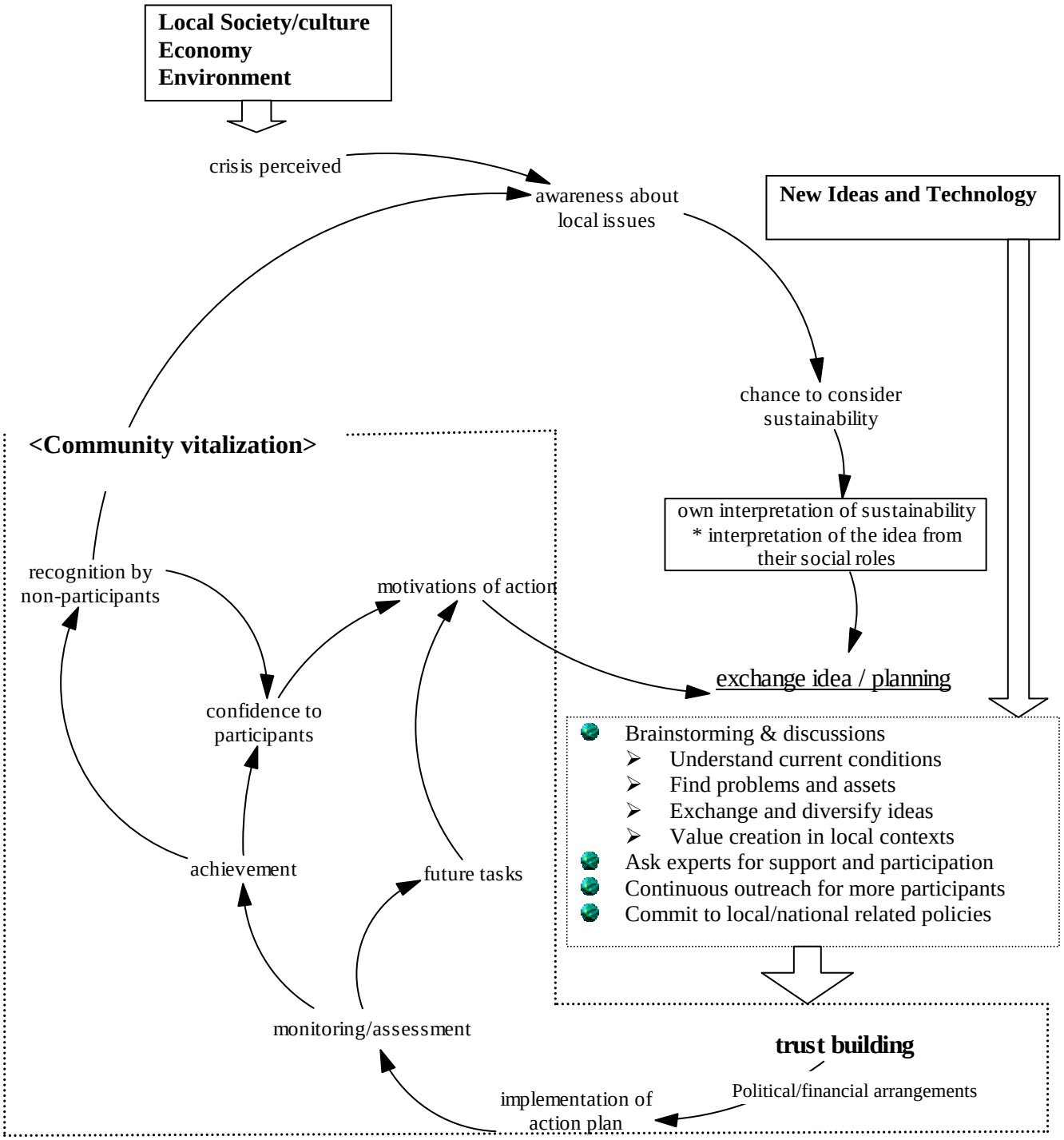

Figure 4-1: Observed networking process

4.2 Paradigm Shift towards Local Networks

These two cases have shown a contrast in paradigm shift from a top-down approach by experts and government to a bottom-up participatory approach inviting more actors broadly (Iida 2005; 313). Regarding the Canola Flower Project, it has a long history of working on local environment degradation, core actors experienced conflicts with detergent industry, local fire office about how to deal with collected cooking oil under the Fire Defense Law. Their experiences of conflict between governmental and industrial sectors occurred during the period dominated by the former paradigm when each sector focused on its own interests. The citizen sector's long time devotion to the environmental conservation of local lake gained recognition gradually from local governments. Applying the case of the Canola Flower Project to the idea expressed Figure 4-1, local citizen sector started to work on sustainable development, and local governments and industries were observed to be secondary participants to the network. As a result, their participation reinforced the development of the Canola Flower Project. Once the core actors of Canola Flower Project gained recognition, trust and cooperation from governmental and industrial sectors, the project started to develop rapidly.

On the other hand, Kuzumaki Town's case was remarkable that the governmental actors joined the local network toward sustainable development in the initial stage of the local network formation under the influenced of both Prefectural and town policies toward renewable energy introduction. The participatory planning approach was observed in Kuzumaki Town's case in the form of a cross-sectoral network between local government and local industry with a point of view as local citizens. This project started to develop when participatory approach was getting more dominant idea in planning process of sustainable development projects.

4.3 Strengths and Weaknesses of the Local Networks

4.3.1 Local Context

Sharing local contexts were observed to have significant contributions in formation of local cross-sectoral networks. From the site visits for this study, communication among local actors were observed to be frank and smooth because people know each other very well in small rural towns of the two cases. Rogers (1995) explains this with a term called homophily that "[h]omophily occurs because similar individuals belong to the same groups, live or work near each other, and share the same interests. This physical and social propinquity makes homophilous communication more likely. Such communication is also more likely to be effective, and thus to be rewarding". This could contribute to formation of local cross-sectoral networks efficiently.

In addition, the projects of the two towns were carefully planed from exchanging ideas among local actors who shared the same local contexts and based on their deeper understandings of local society, culture, economy and environment. Therefore, the project did not always suit to other local communities. Nowadays, the Canola Flower Project and Kuzumaki Town's project are regarded as innovative models of a sustainable community in Japan, and attract lots of visitors who are interested. According to the actors of both projects, most of the visitors attention tends to be the specific measures and devices they are taking such as pellet stoves, and processors to convert used cooking oil into biodiesel fuels. They remarked that any approach just introducing measures and devices that Kuzumaki and Canola took was unlikely to work. As local society, culture, economy, environment, problems and assets differs from place to place, even if the cases of Canola and Kuzumaki have established their own models for sustainable communities, these models were not

always be applicable to other communities. During the interview, Fujii said that she received reports of some failed cases which tried to copy their model just by installing BDF plants. What actors learned from their commitments to the projects was that steps toward sustainability in any community had to be done by local people or people who were very familiar with the local contexts. The Kuzumaki and Canola models were derived from the local problems related to the environment, economy, and society, and then local people who were eager to improve the situation beyond sectors of government, industry and citizen. Referring to the same idea with local context in this paper, MacDougall (2001) remarks that "[l]ocalism…… has become an important contemporary political force; identification with localistic causes can be a powerful political resource".

4.3.2 From Value Creation to Community Vitalization

From exchanging ideas among actors in the two cases, different interpretation of sustainability based on local contexts added a variety of values to the projects. As bioenergy is generated from biological waste, Canola Flower Project and Kuzumaki Town integrated several different values into their projects; renewable energy utilization, biological waste management, protection of local agricultural and forestry industry, contribution to increase self-sufficiency of food products including canola oil and some other canola foods which can be both food and biomass resources, environmental education materials for local school children, canola flower in spring as a tour attraction for those who visit these towns for sightseeing and studying (Shimotenma, 2004; Fujii 2004). In Kuzumaki Town's case, local traditional ironware technique was introduced in pellet stove development. This approach added more value to the pellet stove to emphasize protection of local culture.

Value creation and sharing processes also contributed to diversified approach to the sustainability for both two cases with the local contexts. At the start of both projects, neither Canola Flower Project nor Kuzumaki Town took a holistic approach toward sustainability. Canola Flower Project started to cope with environmental degradation and Kuzumaki Town's initiative was derived from economic concerns. Core actors of the Canola Flower Project admitted that their initial activities toward environmental degradation of local lake focused an end-of-pipe approach. Through trials, errors, and different ideas brought by different actors, the ideas for the projects gradually covered social, economic and environmental aspects of sustainability through networking processes.

According to interviewees, Fujii from the Canola Flower Project, Endo from Kuzumaki Town, trust-building and community vitalization were very important outcomes in two cases throughout the phase of exchanging idea and planning, or processes of value creation and sharing. Trust-building worked effectively in the project, and increased willingness to challenge among actors toward the projects. Case studies in other European countries also confirmed the importance of trust-building (McCormick and Kåberger, 2005; Tomescu, 2005; Fadeeva, 2003), and study by Fadeeva (2003) also lists trust-building as one of the outcomes from cross-sectoral networks. As shown in figure 4-1, processes from trust-building to both "motivations of action" and "recognition by non-participants" were observed to form community vitalization. A government official in Iwate Prefecture admits that Kuzumaki Town case aims at community vitalization as well as its contribution to sustainable development (2005).

4.3.3 Heavy Burden on Facilitator Organizations

Almost all the key actors in the two towns work on the projects along with their daytime jobs on a voluntary basis. This limits the time they can spend for their projects. As well as this time limitation, their networking activities need a certain amount of financial resources. They established facilitator organizations with a few full-time staff, but their financial resources are very limited: membership fees, and subsidies from local / national governments or institutions. The Canola Flower Project Network got involved in starting up a manufacturing and wholesale business of BDF, however this venture business also takes up human resources. Under the financial difficulties which are very common among environmental citizen groups across the country, maintaining the facilitator organizations is still very difficult in these projects. Increasing volunteers is always critical among core actors. To increasing enthusiastic volunteers, efforts to raise awareness among more people would be the most important measure to sustain the existing networks themselves and alleviate burdens on core actors in both projects to work on the project in a more sustainable way.

In the Kuzumaki Town case, core actors in the projects belong to several different citizen groups focusing on different agenda, such as woody biomass promotion and how to combat global warming at the local level. Working at several different citizen groups will help them to have a more holistic understanding and insights toward sustainable town-planning and also contribute to efficient communication among groups, however working with those groups after their daily work will increase their burden to work on the project. This fragmentation of groups goes against "resource use optimization" which Fadeeva (2003) counts as one of the strengths of cross-sectoral networks. She cites Burt's study (1992) and explains the benefit of resource use optimization that "[n]ot only financial but also human resources are shared when several actors come to accomplish certain tasks". In addition to increase participants or volunteers, it could be suggested that local network groups need to be formed, restructured, and integrated to economize actors' workloads for further efficiency.

4.4 Challenges for the Local Networks

4.4.1 Capacity Building of Local Governments

From the study of the two cases, importance for capacity building of local governments was observed in the aspects from politics, finance and human resources.

Since the World War II, the national government tried to centralize the political system all over the nation for economic growth (MacDougall, 2001). Current policy direction is shifting toward more delegation of authority to local governments, or administrative decentralization under the Law for the Promotion of Local Decentralization formulated in 1995, and the Collective Decentralization Law enacted in 2000 (MacDougall, 2001; Sato, 2001). On the other hand, according to the discussion record between Kuzumaki Town Mayor Tetsuo Nakamura and Japanese business leaders at a breakfast meeting held in 2004, adverse effects from the former centralized political structure still remains over local autonomy in Japan.

In the discussion with Nakamura and business leaders (B-LIFE 21, 2004), retired officials from central government often used to become candidates for elections to choose the head of local

government, such as Prefectural governors, city or town mayors.[7] Those candidates tend to miss the focus of the benefit for the locality in the longer-term perspective, due to a lack of understanding of local society, economy, culture, environment and the real local needs.

Nakamura also noted the difficulty in local governments, especially financial dependence on the central government[8]. According to Nakamura (ibis), local municipalities are in the same boat with Kuzumaki Town financially, however considering the assumed decline of tax revenue in national level, the financial situation of local governments is prospected to be worse in the future. Therefore, Nakamura asserts that local governments should seek for financial independence with a view of economically-sustainable community management. As it is less likely to be achieved under the existing political structure, he also asserts that Kuzumaki wants to build a strong partnership with industries for financial as well as technical support as one of the town's policy directions (ibis). Further expansion of the town's networking shall be important to achieve these goals.

Capacity building among local officials toward further understanding of sustainability is critical in local sustainable development programs. Even if the head of local government set the local policy on sustainable development, without proactive commitment by local officials, practical change process will not be possible. From the Kuzumaki case, very influential official of the prefectural government joined the local cross-sectoral network. On the other hand, from the case of Canola Flower Project, Fujii (2004) criticizes the inadequate understanding of sustainability of local officials and states that sectionalism still remains in local governments, which impedes the local policy integration toward sustainable development, and she asserts both in the interview and in her publication the necessity of stronger leadership by the heads of local governments, and policy integration in local governments. She notes that the attitude of local governments for open discussion is not enough to satisfy citizens due to the still remaining eliticism among some local officials (ibis). From the interview with core actors of the project, they also criticize the reluctant attitudes of local officials to further step toward outreach to influencing national policy-making on sustainable development. To cope with these problems, further capacity building of local officials will be indispensable. MacDougall (2001) emphasizes the needs of "an expansion of administrative capacity" among local governments including "the massive upgrading of their administrative skills" (ibis). For this capacity building, especially on the interpretation of sustainable development in line with its locality, and local governmental officials are required to have open attitude toward discussion with local actors.

4.4.2 Partnerships with Industry

In cases of bioenergy projects, conflicts of interest over resources were less likely to occur, because the resources of bioenergy are organic wastes including cooking oil waste and wood barks after timber processing in the cases in this thesis. However, actors in the two projects experienced conflicts of interest between economic interests and sustainable development. Contrary to the Kuzumaki Town case where the core actors are from the industry sector, barriers to work with industry the sector were observed in the Canola Flower Project.

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[7] Until the end of the Second World War, Japanese Home Ministry appointed Prefectural governors. Since 1947, this system has been replaced to election system (MacDougall, 2001). However, Kuzumaki Town Mayor and Japanese business leader notes that central government still sends retired central government officials to be election candidates.

[8]

The canola network facilitators experienced failure in collaboration with a local industries association when they tried to upgrade the BDF plants together (Fujii, 2004). The reason for failure was the difference of their perception of outcome in the time scale. Usually the industry sector needs profit within short periods. However, working on sustainable development projects needs longer time perspectives to have profitable results. Fujii (2004) remarked that she felt this limitation from this failure to work with industry sector. Nowadays, core actors of the Canola Flower Project are seriously concerned about the entry by other enterprises which can manufacture and provide cheaper biodiesel plant. Pursuing short-term profits by local small and medium enterprises can cause conflicts of interests against local networks toward sustainability. This could be solved by shared understanding of the relevance of the projects throughout the whole system. As long as the local industry is based on the local customers, it is not irrelevant to work for local benefits. One of the contributors to Canola Flower Project is a local gas station. Survival in terms of the business perspective requires support from local customers, introducing the idea of sustainable development in industrial perspective and the local gas station integrated the idea into its business activities. This could be done either individually or through participation in the local network. And core actors of the Canola Flower Project want further partnerships with industry, especially the business sector. They feel that entrepreneurship is important in their projects, and believe that they can learn from industry especially in product development, marketing techniques, and organizational management.

As one more aspect in conflicts of interests, local farmers in the Canola Flower Project who allow their rice field to plant vacant rice field during winter will receive the heavy burden of planning and harvesting canola. However, it is difficult for them to feel rewarded from their work because they will not be rewarded financially with growing canola as an agricultural crop. In the framework of Canola Flower Project, initiatives to promote organic farming among local farmers are taken to enhance market competitiveness of local farmers by adding values as locally-produced crops grown with organic farming method, instead of using chemical fertilizers. Core members of the Canola Flower Project try to launch an additional initiative for local farmers to ensure economic benefit from participation to the project such as planning for them to open simple B&B at the farm houses for people and school children for study excursions. To adjust the balance of key contributors for the project, the core members are trying to establish sub-networks to improve economic sustainability for the area. According to McCormick and Kåberger (2005), the same issue was observed in a Swedish case. Convincing farmers to grow energy crops faces difficulties. In this case, local energy companies sought for an alternative measure that the company rented the farmland and grew energy crops instead of farmers.

These two problems in partnership with industry show importance of integrating entrepreneurship into local sustainable development projects. Canola Flower Project recognizes its importance and tries to integrate entrepreneurship into its activities. On the other hand, Kuzumaki Town's approach is supported by successful dairy farming industry and innovative forestry industry. The town's initiative to expand pellet stove users from institutional to household level has just began and needs effective marketing outreach to users, such as effective publicity appealing the values embedded in pellet stove use. Kuzumaki Town also need to have sophisticated entrepreneurial approach developed from the partnership with other industries.

4.4.3 Partnerships with Academia and Experts

Contributors in both projects from academics were from engineering field and provided technical advice in development of BDF plants and biogas plants. Therefore participatory range by academic

field remained to technical level and not much involvement with exchanging idea/planning processes was observed in both projects at the time of this study. Fujii (2005) implies that the opinions from academics who propose the theory-oriented analysis and suggestion make her sense inadequate empirical basis from field work experiences and observes their contribution to be unsatisfactory level. One of the core actors of Kuzumaki Town shares the same opinion. These theory-oriented analysis and suggestions from academics failed to impress local activists in the projects at all and were not persuasive enough to them. It is worth to note because this could undermine trust to external scientists, consultants and experts among local people. Kahn (2004) studies a case of a Swedish municipality which failed to install a biogas facility due to the failure to build up a trustful relationship between local people and specialized developers even if the project itself was carefully planned.

In spite of their criticism to academics, local actors often invite domestic and overseas scientists, professional consultants and experts to their symposiums and study sessions to gain objective advice or suggestions to confirm if they are on a right track from scientific and third-party perspectives. Core actors of Kuzumaki Town added that they want experts who can spend enough time to work with them and to build up trust with local people, and they need advices from experts who built trustful relationship with them after sharing deep understandings of local society, culture, and economy. In these cases, more academics are required to directly get involved with planning process in the community issues by local actors. As universities professors and students started to visit both towns for study, this would be one of chances to build a close relationship with future scientists and experts.

5 Discussion

Promotion of planning and developing sustainable development programs at the local community level is likely to enhance the formation of cross-sectoral local networks, which stimulate local programs based on local contexts with a variety of values created by local actors. The two cases of the Canola Flower Project and Kuzumaki Town indicate the validity of cross-sectoral networks in local sustainable development programs and they also show remaining barriers.

The two cases in this paper, Canola Flower Project and Kuzumaki Town's initiative, are progressive cases of sustainable development programs with bioenergy utilization in Japan. For planning and implementation of the projects, local actors studied renewable energy technology and systems from Germany and Vaxjö City in Sweden. Sweden has been a promoter of sustainable development program longer than Japan. Some municipalities in Sweden are known for local sustainable development with a participatory democratic approach inviting people from various sectors, local government, industry, academics, and citizens. Since 1980s, before a sustainable development guideline called Agenda 21 was adopted at the World Conference on Environment and Development in Rio De Janeiro in 1992, some Swedish municipalities had already started to work on sustainable development at the local level, and those municipalities, so-called eco-municipalities, formed a coalition of eco-municipalities and expanded to the Baltic region. This local movement was followed by nationwide implementation of Local Agenda 21 (LA21) since 1992, after the Rio Summit. Responding to Swedish national policy toward sustainable development, now all the 288 municipalities have their own Local Agenda 21 plans. Looking at the background of this high implementation level in Sweden can help to learn how to enhance local sustainable development initiatives in Japan.

Moreover, in the bioenergy field, the Swedish Bioenergy Association has established cross-sectoral network with local governments, industrial associations, local energy companies, farmers' association, forestry industry associations, engineers, researchers, academics 25 years ago, and has continued to maintain and develop these networks. The Swedish experience can provide important lessons to Japanese municipalities for establishing cross-sectoral networks and local sustainable development programs. In this chapter, general information on initiatives by Swedish municipalities to implement sustainable development at the local level, and the current engagement of Local Agenda 21 in Japan will be outlined. From an interview with one of the co-founders of the Swedish Bioenergy Association (SVEBIO), important lessons will be provided for establishing and developing cross-sectoral networks. Researchers have started to conduct case studies of cross-sectoral networks, or public-private partnerships in Sweden and other European countries (McCormick and Kaberger, 2004; Fadeeva, 2004b; Tomescu, 2005; James and Lahti, 2004). In this chapter, experiences and research from Swedish cases will be explored to discuss with the two cases in Japan, and problems of cross-sectoral networks reported from the research of Swedish and other European cases will be mentioned to compare the potential risks embedded in the two cases of this study.

5.1 Experiences of Sweden and Comparisons with Japan

5.1.1 Swedish Eco-Municipalities (SEkom)

Eco-municipalities in Sweden started from a town called Övertorneå in 1983, the town worked for town development from ecological perspectives for a breakthrough against the town's problems, economic and social depressions. In 1992 their initiatives were presented at the Rio Summit and their practices influenced the formulation of Agenda 21. In 1995, Swedish eco-municipalities established a voluntary network called SEkom, the National Association of Eco-municipalities in Sweden. Through SEKom, those municipalities exchanged their experiences and ideas, and have extended their network to Estonia. (James & Lahti 2004; Eckerberg & Forsberg 1998; ESAM AB n.d.; SEkom n.d.) James and Lahti (2004) introduce Swedish eco-municipalities, and summarize the two major features as "an across-the-board systems and a bottom-up participatory approach". In addition to these two features for enabling cross-sectoral collaboration, it is noteworthy that the first eco-municipality took an approach to cope with economic and social depression by restructuring itself as an eco-municipality covering economic, social and environmental dimensions of sustainability through its initiatives and adding value of its projects for municipality vitalization 20 years ago.

5.1.2 Local Agenda 21 in Sweden and Japan

To discuss the differences of sustainable development programs at the local level, it would be useful to note the implementation of Agenda 21, which was adopted at the Rio Summit in 1992, in Sweden and Japan as a tool of comparison.

> *Because so many of the problems and solutions being addressed by Agenda 21 have their roots in local activities, the participation and cooperation of* ***local authorities will be a determining factor in fulfilling its objectives****. Local authorities construct, operate and maintain economic, social and environmental infrastructure, oversee planning processes, establish local environmental policies and regulations, and assist in implementing national and subnational environmental policies. As the level of governance closest to the people, they play a vital role in educating, mobilizing and responding to the public to promote sustainable development.*
>
> (From United Nations Division for Sustainable Development – Agenda 21 – Chapter 28
>
> Highlighted by author)

Chapter 28 of Agenda 21 emphasizes the importance of local authorities. Sweden had strongly supported the Rio process, and already delegated the overall responsibility of local environmental management planning to local authorities since 1989, therefore Swedish government responded promptly to invite all the municipalities to introduce Agenda 21. Swedish local governments are known for their strong autonomy, such as local independent taxation systems to secure funding for public services to local people (e.g. Iida, 2000). This is helpful to promote local governments to plan and implement sustainable development program based on local contexts. The Swedish government granted 2.3 billion SEK to 42 municipalities in 1998, and 1.2 billion SEK to 55 local projects (Hägerhäll and Gooch, 2002). Distribution of these grants to municipalities was controversial (Eckerberg and Forsberg, 1998), however this shows willingness of the national government to promote sustainable development programs by local governments. This policy by

national government combined with strong autonomy by local governments, all the 288 municipalities introduced Local Agenda 21, and have budgets and staffs for the programs. Criticisms of inadequate invitation of citizens' participation still exist. According to a survey in 1996, 40 percent of the total Swedish population was familiar with the concept of Agenda 21, and 20 percent were familiar with at least one ongoing Agenda 21 project, and 3 percent were directly engaged in a project (Eckerberg and Forsberg, 1998). Researchers regarded these figures as an unsatisfactory level, however compared to Japan, Iida (2000) takes it as a high level. On the other hand, Eckerberg and Forsberg (1998) assert that "[s]ome of the pioneers (pioneering municipalities in sustainable development) have leading politicians backed up by key bureaucrats in strategic positions who have actively brought issues of sustainability onto the local political agenda". This conforms to the finding from Kuzumaki Town's case.

Japanese Ministry of the Environment conducted a survey to investigate how many Japanese municipalities introduced Local Agenda 21. At the time of the survey, 318 out of 3209 municipalities introduced the LA21. However, Aito Town of Canola Flower Project and Kuzumaki Town were not counted in the result in spite that they have sustainable development projects. The list of municipalities that introduced LA21 had plans called Environmental Basic Plans. As Nakaguchi (2002) criticizes that the focus is only the environmental dimension of sustainability. Barret and Usui (2002) analyze LA21 in Japan for the following points: "narrowly focused agenda", "lack of inter-departmental co-operation", "difficulty of ensuring commitment to action from other local stakeholders", "partnership arrangements are difficult to maintain", and concluded as "much confusing in Japan surrounding conceptual groundwork for sustainable development and LA21". The studies also support the importance of capacity building over sustainable development, not only environmental but also economic and social aspects. And these studies also could support the necessity of formation of cross-sectoral networks.

5.1.3 Swedish Bioenergy Association (SVEBIO)

Regarding bioenergy, Sweden has established cross-sectoral networks of bioenergy 25 years ago, which is called the Swedish Bioenergy Association (SVEBIO). Upon its establishment, founders of SVEBIO sent invitation to many different sectors, local governments, academics, farmers' association, forestry industry associations, energy companies and so on. SVEBIO's experience can provide some insights toward such networks. Exactly as the mayor of Vaxjö City advised to people of Kuzumaki Town, Bjorn Ljungblom a co-founder of SVEBIO said that founders of the organization tried to create frank and open atmosphere, to have open and free brain storming session. According to him, the organization also tried to hold meetings on a regular basis to keep contact each other. The members of the organization expanded the range of participants using their own personal or occupational networks. This case sought for cross-sectoral collaboration from the very beginning on contrary to both cases in Japan started from one or two sectors.

Applying this lesson to local sustainable development projects, SVEBIO tried to invite as many as people interested in their keyword "bioenergy". This could be an effective strategy to kick off a cross-sectoral network. Then, how can a local network be formed under a keyword such as sustainable development? As discussed in chapter 4, perception of local issues varies depending on actors, sectors and individuals. These actors, sectors, and individuals need to get together at certain points at the networking process in figure 4-1. Thus, having a capable facilitator or group is very important to form broader network for local sustainable development. In Canola Flower Project, one of co-founders of Environment Co-op, Fujii played a role of facilitator agent to form a cross-

sectoral network over local sustainable development. Any sector can play the role of change agent. On the other hand, Kuzumaki Town's case, town officials, forestry industry representative, and citizen reacted cooperatively worked as facilitators. In those towns, residents know each other very well, and thus information about their activities spread rapidly, and strong bonding among town residents lead to informal discussion opportunity to share their crisis perception and concerns over community's future. The lesson of SVEBIO becomes very important here; hold meetings on a regular basis to keep contact each other. Otherwise, shared perception would not develop into next stage to plan sustainable development project.

In Japan, a citizen organization corresponding to SVEBIO is Biomass Industrial Society Network (BIN) established in 1999. From its core members' list, they are mainly from industries and academics, hence the organization invites researchers, managers of companies, governmental officials and activists in bioenergy utilization to expand its network. The network established recently, however, as bioenergy utilization has started in local areas including the two cases in this paper, the network could extend its network nationwide and worldwide for further diffusion of bioenergy use.

5.2 Problems with Cross-Sectoral Networks

Fadeeva (2004a) lists the problems which can be caused in regard to cross-sectoral networks. In her study, she points out some of specific reasons of failures in cross-sectoral networking such as "[u]nclear or differently interpreted goals, too ambitious targets, lack of credible commitment, neglect of critical partners, lack of monitoring, inability to adjust strategy, lack of trust, missing information links, lack of incentives and sanctions" (ibis). Some of them she points out were observed in the two cases of this paper.

According to this goal issue, observed from the two cases in this study, interpretation of sustainable development can be varied among actors/individuals as discussed in chapter 4, at the same time, the level of internalizing the idea could be different among them as well. The difference of internalization level can limit how much each actor would commit to the projects, and could limit the voluntary contribution by each actor/individual. In the case of the Canola Flower Project, Fujii is observed to be one of the few actors who internalizes the idea most deeply to work for sustainable development, therefore she largely prioritizes her work with the project. In addition to her personal reputation, this could cause the concentration of workload to her compared to others who did not prioritize the activities as she did. Moreover, Halme and Fadeeva (2000) found that "the presence of powerful actors……. forced other networking partners into a relatively passive mode in the collaboration". This could reinforce the overload of Fujii's efforts due to increase of passive actors which could undermine the diversification of ideas brought from the network actors.

The phase of exchanging idea/planning, shown in figure 4-1, could be not only to share ideas among others, but also to internalize ideas individually after exchanging ideas. This can also be a time-consuming process as well as trust-building. Fadeeva (2004a) found it as a process which is resource intensive, time consuming and "contentious" from her case studies. In the two cases of this paper, the process was also labour intensive for core actors and time consuming. In the bioenergy cases of this paper, the process was observed not to have been contentious, however it could be expected as a future concern that some actors do not always receive benefits or recognition as much contribution and dedication as they made to the local networks and projects. In the two cases, imbalance of benefits among actors has not been observed yet as no actors receives outstanding

benefit from the projects. However, some actors from local industry sector especially agricultural and forestry sectors in the cases of the Canola Flower Project and Kuzumaki Town are struggling to gain a breakthrough from the projects. How they perceive their problems and evaluate their commitment could turn to be positive or negative attitude to the projects. Both bioenergy initiatives have just started to develop, therefore further research from a longer time perspective would be necessary. As Fadeeva (2004a) admits, further "managerial support" and/or strong leadership by network facilitators to help other actors flexibly would be also important.

5.3 Possibilities of Cross-Sectoral Networks

Local network activities started in the two cases from local problems under influences from some of external factors. These factors are not always problems of locality. At the same time, these factors can be big barriers for further development of the projects. Some of the external factors related to the two cases cannot be neglected. There factors are beyond the scope which can be dealt within the range of activities by local networks, that is, not local but national issues. Here are the factors as follows:

- Insufficient political instruments to support renewable energy production
- Decline of agricultural and forestry sectors in Japan

For one thing, political instruments to promote renewable energy use such as the carbon tax in Sweden have not yet been established in Japan. Moreover, there is neither an organization nor policies in charge of low temperature heat supply and use as seen in Sweden, political instruments such as subsidies to new technology, renewable power purchase have not boosted renewable energy production and diffusion (Iida, 2005).

Second, the existence of local agricultural and forestry sectors is extremely important in bioenergy introduction. Resources for bioenergy is depends on organic wastes generally derived from agricultural wastes, such as excrements of livestocks, residues after harvesting agricultural crops, and residues from forestry. However, the Japanese agricultural and forestry sectors are in serious decline (MAFF, 2004; Sakamoto, 2005: 2004), facing with income decline and a decreasing and aging population of workers. This issue is too broad to deal with in this paper, however it seriously affects the local industry actors in the two cases. Therefore, protecting the agricultural and forestry sectors in the areas is one of the biggest goals for the two cases as the both sectors are closely related to both economic and environmental sustainability. Core actors in both projects seek for additional measures beside bioenergy introduction for local agricultural sector by supporting both sectors in planning entrepreneurial strategies: planning to open simple bed and breakfast for sightseeing visitors and school children for summer school, appealing to local agricultural crops' safety as they are growing organic products, and so on.

The possibilities of cross-sectoral networks in the two cases are that they could be empowered politically through their activities as the recognition by non-participants grows. Fadeeva (2004a) admits the possibility of community empowerment. In fact, one of the most important core actors of the Canola Flower Project, Ayako Fujii now works with central government. Thus, challenges for local networks still remain though, their initiatives could give them not only c ommunity vitalization, shown in figure 4-1, but also chances to influence national policy to change external factors, such as those listed above.

This chapter suggests the necessity to promote local initiatives toward sustainable development to enhance formation of cross-sectoral networks in local areas. At the same time, as shown in figure 4-1, each sector possibly will have a different perception of crisis. To form a cross-sectoral network, finding a common interest is critical, and linkages and common benefits have to be found among local government, industry and citizen sectors. Without understanding of sustainability which entails economic, environmental and social dimensions, partnerships among these sectors is less likely to be formed or could be still fragmented, that is, it could cause considerable difference of commitment to the projects and also could lead to conflicts among actors. Two cases in Japan indicate that each sector, local government, industry and citizen can be core actors and function as facilitators for the whole project. On the other hand, without support by local government, sustainable development programs of two towns would not likely be implemented. In addition, actors in the two cases started to get empowered politically as the projects received recognition by non-participants both inside and outside of their areas. This shows the possibilities of how local initiatives and networks can influence policy-making to change external difficulties which they are facing and they cannot change directly by themselves.

5.4 Research on Cross-sectoral Networks

Two towns in this study have just introduced bioenergy recently to their local sustainable development projects. The assessment of their activities has not been conducted yet. As the project proceeds, the results and rewards from the projects could influence the internal relationships of actors among the cross-sectoral networks. As the two projects in this paper are progressive cases in Japan, therefore their initiatives could influence other on-going projects in Japan, and could influence policy-making to support bioenergy and other renewable energy production from local to national level. As stated in the introduction, coordination among each actor would be critical to implement bioenergy projects. These two cases could give important lessons to the following local initiatives, at the same time, the cases in this paper needs continuous research and evaluations as well as studying more cases of Japan and other countries.

6 Conclusion

In the two cases of this study, the cases of the Canola Flower Project and Kuzumaki Town, cross-sectoral networks contributed to the local bioenergy projects in planning and coordination. Through processes of discussion and exchanging ideas, cross-sectoral networks helped local actors to share interpretations of the sustainability concept by each actor based on their local contexts of economy, society, culture, environment, local needs and future vision. Regardless of the difference in local contexts between the two cases, these networking processes gradually deepened their understanding on sustainability from broader perspectives. As a result of sharing different interpretation among actors, their activities toward sustainable development added diverse values to the projects such as renewable energy utilization, biological waste management, protection of local industry, promotion of locally-produced foods, etc.

Important outcomes from the local cross-cultural networks were trust built up among local actors and community vitalization. Through their trials and errors, their networks expanded, started to receive recognition by non-participants, and led to community vitalization. The result of the two case studies in this paper implies that local cross-sectoral network could play a leading role in local sustainable development projects.

Formation of cross-sectoral networks started from the perception of crisis by local people which could be derived from any of economic, social and environmental sustainability. Following drivers to build cross-sectoral networks were observed from the two cases: Existence of capable opinion leaders and facilitating organizations, active involvement of influential government officials,

In turn, lack of factors above could be the barriers to formation of networks. Capacity building of local government was observed to be particularly important from political, financial, and human dimensions. From human dimension, even the strong leadership with the head of local governments, active commitments from influential local officials was critical both in formation of cross-sectoral networks and the proceedings of the projects. Moreover, local governments still have remaining influences from the central government by former centralized political structure. Under the existing system, local governments are dependent on the central government financially. In addition to capacity building of local officials to nurture their understanding of sustainability and open attitude to work with other local actors, empowerment of local governments would be beneficial in formulating local sustainable development projects with cross-sectoral networks. In the two cases of this study, recognition to their activities led to the empowerment of local networks to influence national policy-making in local sustainable development and political framework toward renewable energy diffusion.

Actors in the two cases learned from Sweden, Denmark and Germany. They learned not only technology and systems of renewable energy. Some received important insight about forming cross-sectoral networks. The tip was to create an open and informal atmosphere for exchanging ideas. This was confirmed by the experience of the Swedish Bioenergy Association. In addition to the insights from Swedish experiences, lessons learned from cross-sectoral networks could be summarized as follows:

- Create an open and informal atmosphere for start-up
- Know your local problems and assets

- Keep on working constantly
- Try continuous outreach and diversify networks

Having an informal relationship leads to an open atmosphere for brainstorming, and more productive discussion. Knowing the local assets and problems gave opportunities to deepen their understandings on local issues which became the basis for interpretation of sustainable development. Keep on working constantly was also important to build and maintain relationships, and led to outcomes to move forward. Inviting participants to the network diversified ideas and added different values on the projects. This is also important to sustain the network by increasing participants as the heavy workload among the core actors was observed from the two cases.

Case studies of European countries also show the potential risks embedded in cross-sectoral networks those risks could come arise as the projects proceed and can impede the expected function, further development by the local networks, and sustainable development goals. These studies also warn that the contribution and function of cross-sectoral networks could be overrated. Therefore, further study of cross-sectoral networks would increase its importance with longer time scope and different points of views.

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Appendix: Interview Participants

Name	Position	Organisation
Mrs. Ayako Fujii	Representative	Canola Flower Project Network
Mr. Minoru Yamada	Director General	Canola Flower Project Network
Mr. Morihiro Fujii	City Planning Division	Higashi-Omi City Government
Mr. Yasuhito Endo	Representative	Kuzumaki Wood Works
Mr. Shigeru Kanazawa	Senior Managing Director	Kanawaza Forestry
Mr. Tetsuya Sonoda	Senior Researcher	Iwate Industrial Research Institute
Mr. Naofumi Seki	Representative	At Home Kuzumaki
Mr. Ken Abe	Senior Policy Director	Iwate Prefectural Government
Mr. Hiroshi Shimotenma	Renewable Energy Division	Kuzumaki Town Hall
Mr. Toshio Kobayashi	Representative	Hananomaki Swimming School
Mr. Yutaka Kibihara	Staff	Wind and Forest Eco-School
Dr. Jamil Kahn	Researcher	Environmental and Energy Systems Studies, Lund University
Mr. Lennart Ljungblom	Co-founder	Swedish Bioenergy Association