

An Analysis on the Projects Structure to Expand Renewable Energy

— A Case Study of the Maniwa Biomass Project in Japan by Checking from the Viewpoint of PPP (Public Private Partnership) —

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Abstract

After the adoption of UNFCCC in 1992, the expansion of renewable energies has been pursued by planning various regional development projects in Japan. In this paper, we made a case study on the regional development project of Maniwa City in Japan. Because this project has continued during past 24 years step by step, we can definitely say this project is one of successful examples.

First, though the regional development projects in Japan were often made under the leadership of the central governments, they were not always successful. Judging from the case of Maniwa, the participation of local players from the public, private and other sectors and the cooperation among them would be crucial.

Second, the searches and pursuits of local needs would be a quite important task for the regional developments. In the case of Maniwa, this role has been charged by NPO “Maniwa circle for the 21st century.” The function for local opinion exchanges would be also crucial.

Third, the participation of powerful local companies would be essential to accomplish the projects. In the case of Maniwa, this role has been played by Meiken Kogyo Co., one of local leading company in the wood sector. The participation of local strong company from the private sector would be essential.

Forth, the continuous piling up of various projects step by step over the long period would be required for the successful developments. Because of this, the role of local government such as Maniwa city government and its connection to central government would be also a key factor.

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1. Introduction

After the adoption of UN framework convention on climate changes (UNFCCC) in 1992, the expansion of renewable energies has been pursued to a great extent by planning various kinds of regional development projects in Japan. In the past 25 years, we have experienced so many happenings and troubles related to the introduction and expansion of renewable energies through these projects.

In December 2015, the Paris agreement on post Kyoto GHGs reduction was finally approved by many countries including various developing countries. In May 2016, Japanese Government has authorized the new target of GHGs reduction to achieve 26% reduction from the emission level in 2013 up to 2030. In addition, Japan need to intensify GHGs reduction measures, because she already committed 50% (or 80%) reduction of GHGs in 2050 in the long-run.

Thus, the expansion of renewable energies related to regional development projects will be one of important options to achieve GHGs reductions in Japan. In this paper, we made a case study on the regional development project in Maniwa City, Okayama Pref. of Japan. Because this project has continued during past 24 years with step by step progresses, we can definitely say this project is one of successful examples in Japan.

2. Methods

First, we surveyed historical events on the regional development projects in Maniwa city which was focusing local biomass and wood resources. We especially discussed in this study what kinds of biomass projects has been piled up step by step during the past 24 years and also checked how to expand these projects synergistically.

Second, we analysed on the players' structure of various biomass projects, respectively. We also discussed who was a key player in order to make these projects successful and what kinds of player's relationship were required for these projects, if judging from the view point of PPP (public and private partnerships).

Third, by checking statistical data such as population and finance in Maniwa city, we analysed the effects brought by the regional developments.

Finally, we summarized several conclusions of this paper.

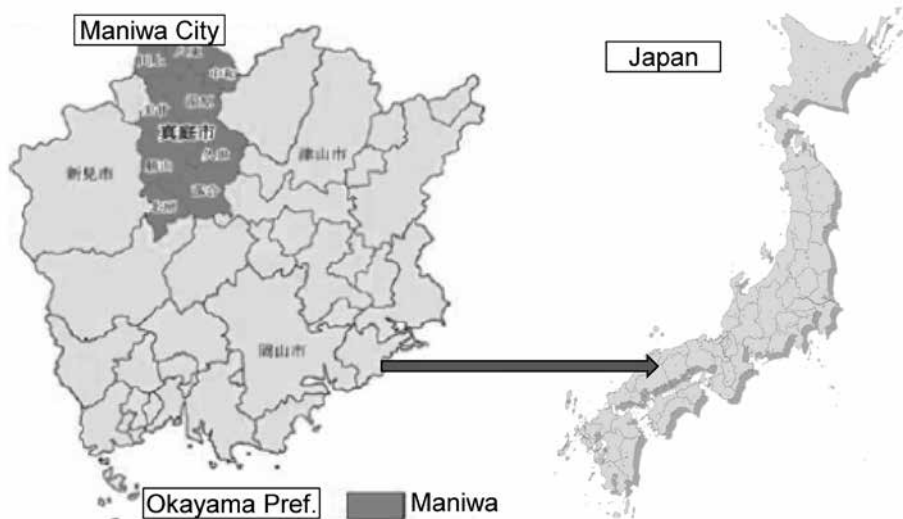
3. Results

3 – 1 Historical movements on the Maniwa biomass projects

Maniwa City in Okayama Prefecture is located in the West part of Honshu in Japan as shown in Fig. 1. Maniwa City is in a basin and highland surrounded by Chugoku mountain area and is endowed by rich forest resources. Maniwa City is a typical rural mountain area which is 828 square kilometers.

Maniwa City was started from the end of March, 2005 by the merger of 9 towns and villages: Katsuyama,

Ochiai, Yuhara, Kuze and Hokubou Towns and Miama, Kawakami, Yatsutsuka, and Chuka Villages. The population of Maniwa City was 46,714 in August, 2017.



(Source) Made by using the figure cited in Reference [2].

Fig. 1 The location of Maniwa City in Japan

Table 1 shows historical events on the Maniwa biomass projects [1-3]. “Maniwa Circle for the 21st century” in which local younger people got together and started the discussions on various kinds of regional development projects from 1993, as shown in Table 1. Based on the discussions in this circle, firstly, the eco-friendly power generation using bio fuels was started in 1998. The period during 1993 through 1998 was the preparation stage of regional development projects.

The first stage of regional development projects was the period during 1998 through 2005. In this stage, the industrial cluster plan using woody resources was made in 2001 and the wood chip cement and cat litter were commercialized in 2002. “Maniwa Circle for the 21st century” got a NPO legal personality also in 2002 and the Maniwa forum was held in 2003. As described already, Maniwa City started by the merger of nine towns and villages in 2005.

The second stage of regional development projects during 2005 through 2013 started by the merger to Maniwa City. The regional development projects were supported by the NEDO demonstration project adopted in 2005. The Maniwa city biomass town plan was announced in 2006 and “Biomass tours Maniwa” were started also from 2006. The most important achievement in the second stage was the construction of

Maniwa biomass gathering station in 2009. The utilization of domestic credits system was also started in 2011, as shown in Table. 1.

Table 1 Historical events on the Maniwa biomass projects

Time	Event	
1993.04	“Maniwa Circle for the 21st century” (Private organization) was started.	Prep. stage
1997.10	A symposium on environmental-friendly town developments was held.	
1998	The eco-friendly power generation using bio fuels was started.	
2001.03	The industrial cluster plans using woody resources were made.	1st stage
2002	Wood chip cement and cat litter were commercialized.	
2002.11	“Maniwa Circle for the 21st century” got a NPO legal personality.	
2003.02	The Maniwa forum was held.	2nd stage
2005	Maniwa city started by the merger of towns and villages, NEDO demonstration project was started.	
2006.04	The Maniwa city biomass town plan was announced.	
2006.12	“Biomass tours Maniwa” were started.	
2007.10	The next-generation energy park plan was authorized.	
2009.04	Maniwa biomass gathering station was constructed.	3rd stage
2009.06	Maniwa biomass project was selected as 100 greatest new energies.	
2011	The utilization of domestic credits system was started	
2013.03	The guideline for Maniwa city woody biomass energies utilization was made.	
2013	The Maniwa biomass industrial forests and city plan was made.	
2015.04	The large-scale Maniwa biomass power generation plant was started.	

(Source) Made from various information cited in References [1-3]

The third stage (the recent stage) of regional development projects was started from 2013 and continued up to now. The guideline for Maniwa city woody biomass energies utilization and the Maniwa biomass industrial forests and city plan were made in 2013. The most important achievement in this stage was the completion of the large-scale Maniwa biomass power generation plant in 2015.

In the next section, the details of development projects in the recent stage will be discussed. Anyway, based on the discussions in “Maniwa Circle for the 21st century”, various kinds of development projects such as the eco-friendly power generation, the industrial cluster plan, the commercialization of wood chip cement and cat litter, the biomass town plan and so on has been piled up until now.

3 – 2 Recent situations of Maniwa regional developments projects

As already described in the preceding section, the recent stage of Maniwa regional development projects was started from 2013. Figure 2 shows the whole aspects of the recent stage of Maniwa regional development projects centering Maniwa biomass industrial forests and city plan which was made in 2013.

This plan was composed of the following four projects for commercialization; (1) the biomass power

generation project, (2) the biomass refinery project, (3) the organic wastes recycle project and (4) the industry tours/related industry expansion and promotion project.

The biomass power generation project aimed to construct a large-scale woody biomass power plant by using the woody biomass gathering center established in 2009 effectively. The generation capacity of power plant is 10,000 kW and the plant can supply electricity to 22,000 house holds. This project played a center role in the biomass industrial forests and city plan.

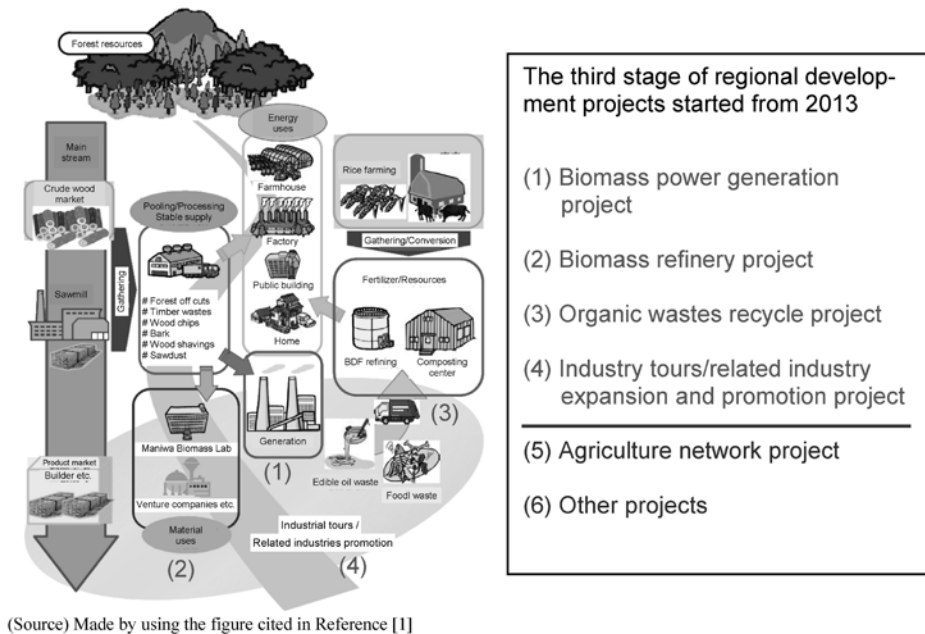


Fig. 2 Whole aspects of the recent stage of Maniwa regional development projects

In addition to the four projects mentioned above, the recent stage of regional development projects included (5) the agriculture network project and (6) other projects such as the “Tonbo no Sato (Dragonfly village) project, Yuhara hot spring project etc. These projects were deeply related to (4) the industry tours/related industry expansion and promotion project.

Maniwa regional development activities have been continued by piling up various projects during the quarter of century. We can definitely say this project is one of successful examples in Japan.

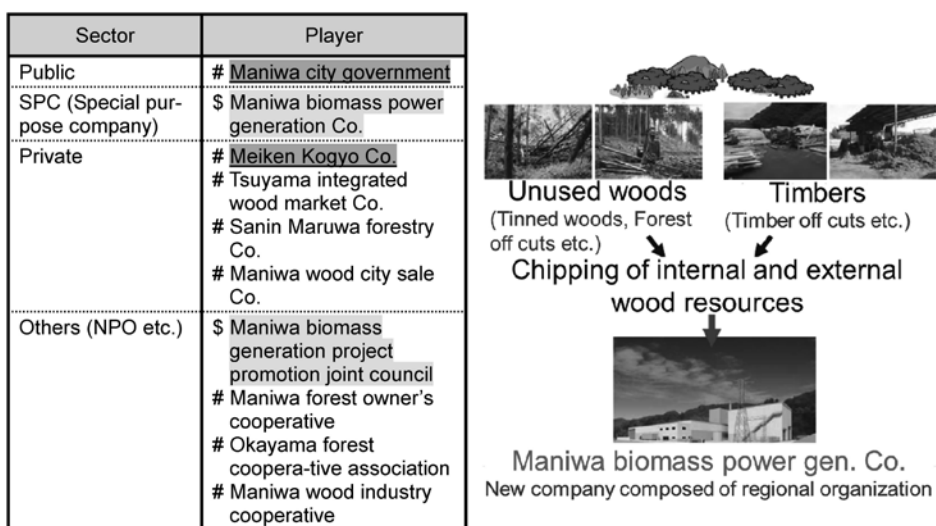
In the next section, as for three projects such as the biomass power generation plant project, the biomass refinery project and the agriculture network project, the detailed structure of PPP (public private partnership) will be discussed individually.

3 – 3 PPP structure of recent Maniwa regional development projects

(1) Biomass power generation project

The PPP structure of biomass power generation plant project is shown in Fig. 3. The players with underline and marking are a key leading one in the project. The players with “\$” and marking are an organization for linking various players participating to this project. These expressions are common in Figs. 3-5.

The notable characteristics in the players’ structure are that the local powerful players are joining to the projects from the public and private sectors, respectively. Especially, the role of Maniwa City government and Meiken Kogyo Co. had a quite important role in this project.



(Source) Made by using pictures cited in Reference [2]

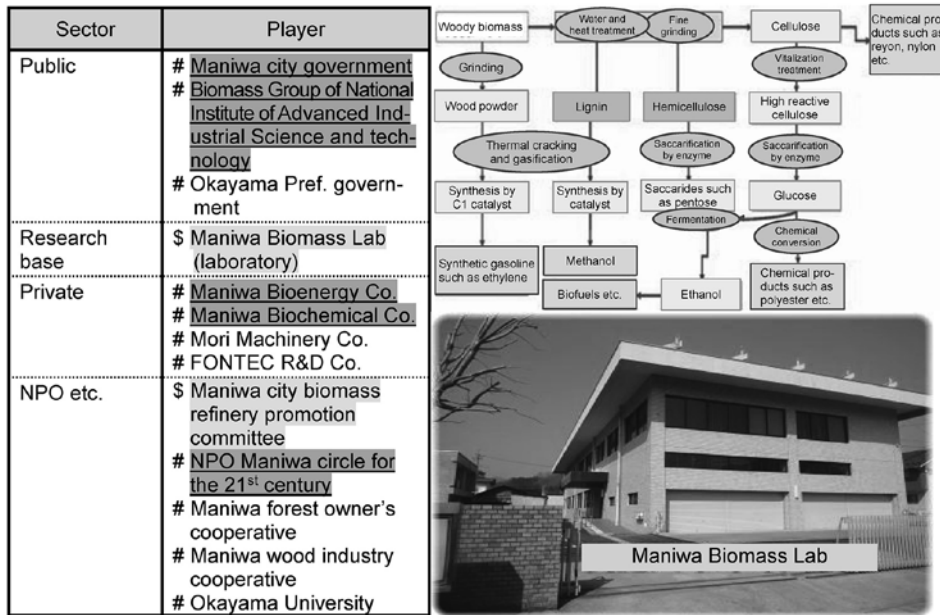
Fig. 3 PPP players’ structure of biomass power generation plant project

Considering from the viewpoint of PPP (public private partnership), the establishment of Maniwa biomass power generation Co. by nine related organization including Meiken Kogyo Co. and Maniwa City government was indispensable. The establishment of Maniwa biomass generation project promotion joint council was also crucial for the linkage of participating players to this project.

Above all else, the participation of Meiken Kogyo Co. to this project should be highlighted strongly, because MeikenKogyo Co. is a local company in Maniwa City which has strong international competitiveness in the wood industry sector and is quite powerful in the biomass resources field.

(2) Biomass refinery project

The PPP structure of biomass refinery project is shown in Fig. 4. In this project, it is noted that one of major players, Maniwa city government supplied the research base called “Maniwa Refinery Lab (laboratory).” The participation of the biomass group in the National Institute of Advanced Industrial Science and Technology (AIST) was also specific characteristics in this project.



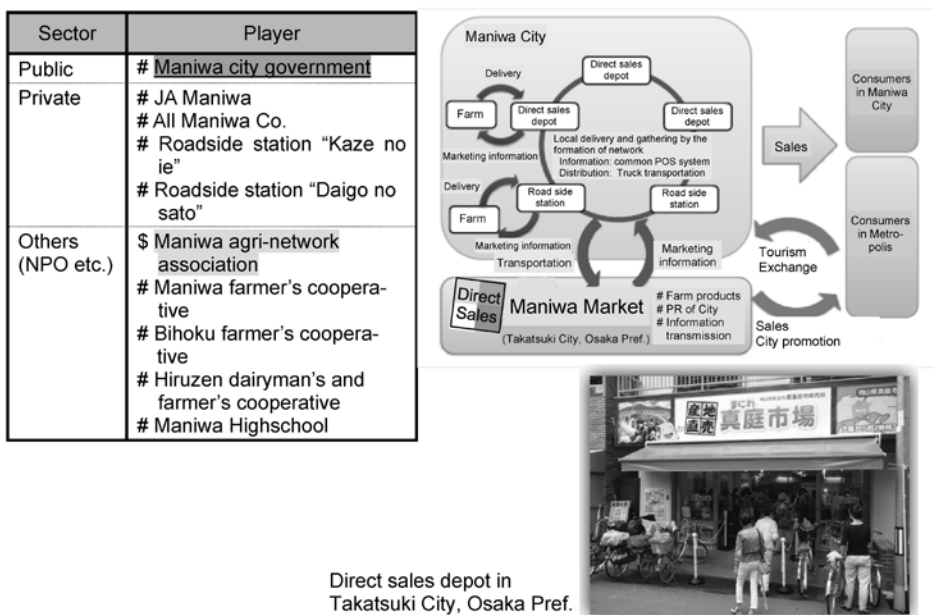
(Source) Make by using picture and figure cited in References [1] and [4]

Fig. 4 PPP players’ structure of biomass refinery project

The major purpose of this project is to develop the future world on the utilization of biomass resources. Therefore, NPO “Maniwa circle for the 21st century” participated to this project and made large efforts to activate this project. The establishment of Maniwa city biomass refinery promotion committee was crucial for the linkage of participating players to this project, as shown in Fig. 4.

(3) Agriculture network project

The PPP structure of agriculture network project is shown in Fig. 5. The main purpose of this project is to make a usefule network among agricultural producers, sellers of agricultural products and consumers in Maniwa City and the metropolitan area such as Osaka.



(Source) Made by using the picture and figure cited in References [2] and [5]

Fig. 5 PPP players' structure of agriculture network project

For this purpose, direct sales depots and road side stations in Maniwa City are networked and individual farms deliver their agricultural products to this network by providing market information from the network. The consumers in Maniwa City purchase necessary products from direct sales depots or road side stations directly.

This agri-network also tried to make direct sales in the Metropolitan area. For this purpose, the direct sales depot called "Maniwa Market" was opened in Takatsuki City of Osaka Prefecture, as shown in Fig. 5. The tourism information exchange is included in the role of direct sales depot .

Needless to say, Maniwa city government concentrated her efforts to promote the network making eagerly. The Maniwa agri-network association was also crucial for the linkage of participating players to this project, as shown in Fig. 5.

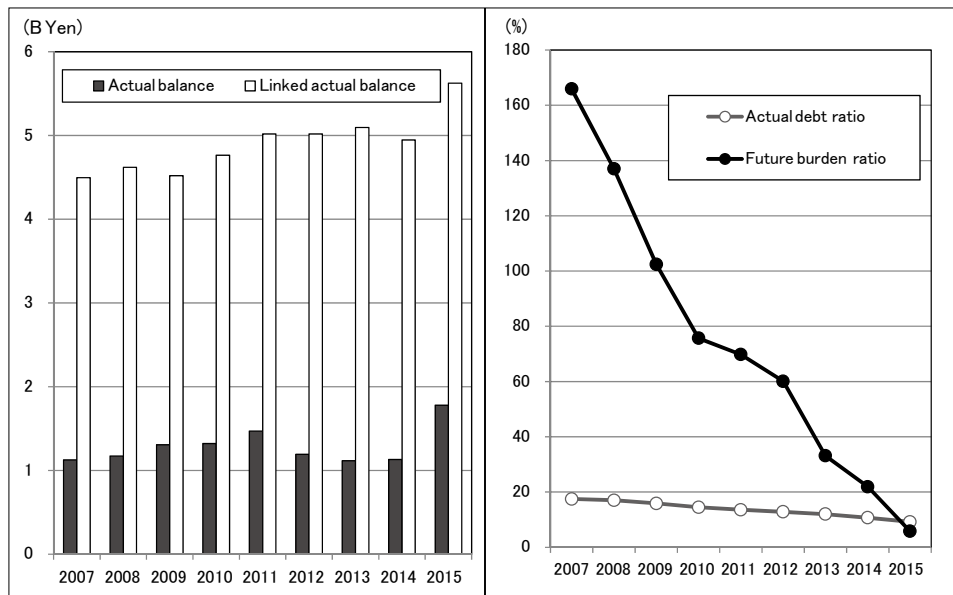
3-4. Macro Effects induced by Maniwa regional development projects

The regional developments in Maniwa City has been continued during the past 24 years by expanding various biomass and agricultural projects step by step. We also analysed the financial data in Maniwa City [6-7].

The five indicators were selected in order to check the healthy status of local government finance generally from June, 2007 in Japan. The five indicators are as follows; (1) the ratio of actual balance (calculated and checked only a deficit case), (2) the ratio of linked actual balance (calculated and checked only a deficit case),

(3) the ratio of actual debt, (4) the ratio of future burden and (5) the ratio of fund shortage (calculated and checked only a shortage case).

Accompanied with these developments, the finance situations in Maniwa City has been improved and changed to a healthy state, as shown in Fig. 6. Especially, the future burden ratio has been improved drastically. The single actual balance and linked actual balance always showed a positive value and this fact indicates quite healthy finance situations.

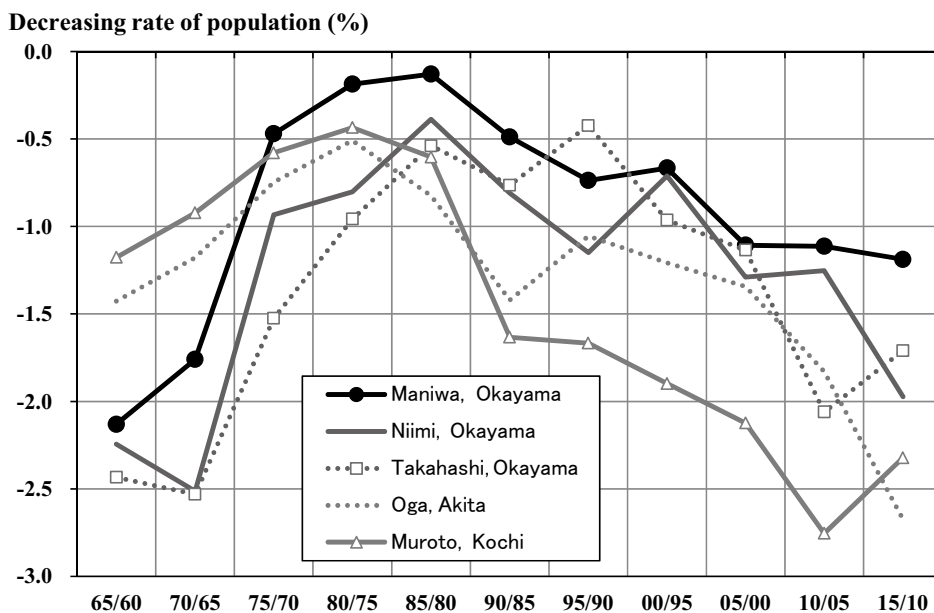


(Source) Maniwa City Government, “Announcement on the ratio on healthy finance judgement and fund shortage” (from the versions in every year).

Fig. 6 Improvements of finance situations on the Maniwa City Government

In addition, the population decreases in Maniwa City has not been accelerated since 2000, as shown in Fig. 7. The population decreases in Maniwa City could not stop, but the changes in the decreasing rate have been levelled off. This situation is somewhat different to other cities shown in Fig. 7.

It is considered that the vital activities of regional development projects in Maniwa City would indirectly influence to the healthy changes of finance situation in this city and also the mild changes in the decreasing rate of population in this city.



(Source) Ministry of Public Management, Home Affairs, Posts and Telecommunications, “National population census,” each version (every five years).

Fig. 7 Changes in average annual decreasing rates of population in five years period for Maniwa and other cities

4. Concluding remarks

First, though the regional development projects in Japan were often organized under the leadership of the central governments, they were not always successful. Based on the successful example in Maniwa City, the participation of local players from the public, private and other sectors and the linkage of these local players would be crucial.

Second, the searches and pursuits of local needs would be a quite important task for the regional developments. In the regional developments in Maniwa City, this role has been covered by NPO “Maniwa circle for the 21st century.” The function for local opinion exchanges would be also crucial.

Third, the participation of powerful local companies would be essential to accomplish the regional development projects. In the case of Maniwa City, this role has been played by Meiken Kogyo Co., one of local leading company in the wood industry sector.

Forth, the continuous piling up of various projects step by step over the long period would be required for the successful regional developments. Because of this, the role of local government such as Maniwa city government and the connection between local and central government would be also a key factor.

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