Eco-Industrial Estate Development in Thailand: Japanese Perspectives from the Amata Nakorn Industrial Estate[1]

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Abstract

This research aims to identify key factors in eco-industrial estate development in Thailand by investigating the strengths and weaknesses of the participation of Japanese companies in eco-industrial estate development in the Amata Nakorn industrial estate from business cultural perspectives. The Japanese government has had the intention to help transform existing Thai industrial estates into eco-industrial estates in the past. In 2012, the Thai and Japanese governments promoted development of an eco-conscious industrial estate, referred to as the One Stop Service model project, in the Amata Nakorn industrial estate. Past attempts, however, have stalled or present very little progress. There has been no study to analyze the key factors impacting the eco industry transformation from a business cultural perspective.

This research revealed that the participation and expertise of Japanese consultants significantly helped

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build an eco-industrial estate model and strengthen project development and business planning. However, Japanese participation in eco-industrial development faced communication and cultural barriers in business that reduced work efficiency of the project members. Different languages and business cultures are major barriers in working together between Thai and Japanese participants. For future eco-industrial estate development, more efforts to understand Thai society, professional style and business culture are needed for Japanese or foreign investment project members and also improvement of communication skills among other project members is recommended.

Introduction

The ASEAN Economic Community (AEC) opens up a new door to further economic development in the South East Asian region. There is an urgent need to find a way for effective implementation of the eco-industrial estate development model in the AEC region. The eco-industrial estate concept is essential for sustainable development of the Thai economy and further expansion of the manufacturing sector in Thailand. The goal of the eco-industrial estate concept is to maximize the economic performance of tenant companies while minimizing the environmental impact. Therefore, successful implementation of the eco-industrial concept is a key success factor for further economic development of Thailand.

Several attempts have been initiated between the Thai and Japanese governments to transform existing Thai industrial estates into eco-industrial estates. There is a significant proportion of Japanese factories located in Thailand and particularly in the Amata Nakorn industrial estate. Therefore, the Japanese government has initiated a project to help Thai industry transform into eco-industry. These efforts also provide direct and indirect benefits to Japanese companies that do business in Thailand. However, previous attempts to help

promote an eco-industry have been stranded with very little progress. There has been no study to investigate the key factors impacting the transformation from a business cultural perspective.

Sakr, et al., analyzed the key factor for successful development of eco-industrial parks (EIP). They found that symbiotic relationships, information sharing and awareness, financial benefits, organizational structure and legal and regulatory frameworks are key factors affecting EIP development.[4] Other factors in addition to financial and regulatory factors affecting eco-industrial development could be business culture related factors. Therefore, this study explored the case study of the Amata Nakorn industrial estate development project through Japanese perspectives.

Key Issues for EIP Development

Involvement of Japanese companies in eco-industrial estate development can be a great advantage for Thailand. However, there are factors that limit Japanese ability and exercise their expertise in these projects. In 2010, an MOU was signed between the Japanese Ministry of Economy, Trade and Industry (METI), the Department of Industrial Works (DIW) and Amata Corporation to conduct a feasibility study on transforming the Amata Nakorn industrial estate into an eco-conscious industrial estate. In November 2012, an MOU was signed to study the possibility of commercialization of the One Stop Service (OSS) model between DIW, Amata Corporation, METI and a working group under METI called the E-Kansai working team. OSS aims to provide a solution for waste management problems found in tenant companies within the Amata Nakorn industrial estate.

Cultural and communication issues have affected the OSS project, especially at the first period of the project. The initial period was the most important phase for OSS business planning. Since the OSS project involved companies from two countries, Japan and Thailand, there were some communication issues during the project, along with a difference in business culture throughout the project. Daily communication in formal meetings was conducted through

[4] Sakr, "Critical success and limiting factors for eco-industrial parks".

interpreters, which made it sometimes difficult for both parties to understand or communicate with each other. A study by Calhoun showed that a foreign enterprise is disadvantaged when doing business abroad. The concept of liability of foreignness was introduced by Hymer in 1960, which has received attention from various fields. Liability of foreignness is a concept in which foreign firms are "disadvantaged in comparison to native firms by gaps in understanding caused by cultural variation that impacts both the firm's external and internal environments."[5]

Furthermore, Schomaker, et al., have pointed out that a language barrier plays a significant role for foreign companies doing business abroad: "Language is an especially apparent contextual difference. Misunderstandings and the extra communicative effort occasioned by one or both sides having to work in a non-native language can exacerbate already complex tasks."[6]

During the initial phase of the OSS project, from November 2012 to March 2013, the Japanese companies were unable to have a full understanding about waste laws and regulations or had limited access to waste related data. The Japanese companies had to rely on the Thai side to do information gathering. During the project preparation, the Japanese consulting firm also had difficulty in understanding local waste related laws and regulations. These were some of the barriers that the Japanese side faced in eco-industrial development. These barriers could be one of the reasons why the Japanese and Thai eco-industrial estate project have become stranded or have made very little progress. Therefore, this research aimed to (1) identify the difference in eco-industrial estate development concept between Japan and Thailand and (2) identify strengths and weaknesses of Japanese company participation in eco-industrial estate development in the Amata Nakorn industrial estate from business cultural perspectives.

The research was conducted by reviewing relevant literature, comparing eco-industrial estate development in Japan and Thailand, and observing the OSS project at the Amata Nakorn industrial estate.

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[5] Calhoun, "Unpacking liability of foreignness".
[6] Schomaker, "The Role of Language".

As well, Japanese eco-town experience was studied from relevant government's websites and research papers. Background of the development of industrial estates to eco-industrial estate development in Thailand was studied through the research papers and relevant websites to make a comparison between the two countries. Finally, on-site activity in eco-industrial estate development was carried out during the OSS project. Useful data and information was obtained from actual project participation and observation.

Amata Nakorn is located in Chonburi province 57 kilometers from Bangkok between the Bangna-Trad Elevated Expressway and Bangkok – Chonburi Motorway. Amata Nakorn industrial estate was established in 1989 and currently accommodates 550 factories within the industrial estate as of 2014.

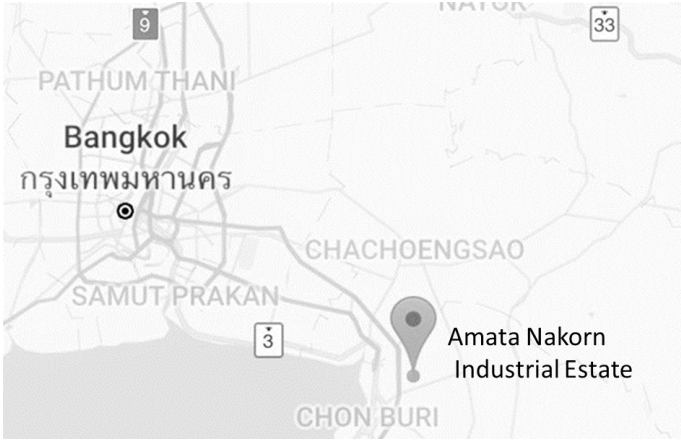

Figure 1: Map of the Amata Nakorn industrial estate
Source: Google Maps

Results and Discussion

Eco-Town Concept in Japan

Japanese eco-towns first evolved in Japan in 1997 for two reasons. One was to revitalize the local economy and second was

to solve waste problems. After the bubble economy collapse in Japan in the 1990s, there was an urgency to remodel the social and industrial structure and construct environmental conscious towns through cooperation between the government, industries and local communities. The Japanese eco-town project was based on zero-emissions and the 3R concept – reduce, reuse and recycle. Fifteen years after the first eco-town was established in Japan, there are now 26 eco-towns all over Japan. There are four factors that have supported eco-town development in Japan. These factors are: (1) a well-designed eco-town project initiated by the national and the local governments with attractive subsidies by both METI and the Ministry of Environment (MOE); (2) the government's legislative support for eco-town development; (3) commitment by companies to the eco-town project; and (4) social awareness and initiatives to environmental activities. Figure 2 explains the roles of the national and the local government in a well-designed eco-industrial town project. The national government implements fundamental policies and support systems and approves or disapproves the plan submitted by local governments. The national government then offers two types of subsidies, hardware and software. The hardware subsidy is for construction of recycle and reuse facilities and subsidizes one-third of the total project cost. The software subsidies are for eco-industrial town planning to a maximum of 50% of the cost. The local governments play a central role in creating the eco-industrial town action plan. The action plan should take advantage of the local characteristics and meet certain standard of originality and innovativeness. The plan also has to connect local citizens and local industries to participate. METI and MOE have jointly approved 26 eco-towns all over Japan.[7]

[7] Global Environment Center Foundation, "GEC Legal and Other Support Systems for Eco-Towns in Japan".

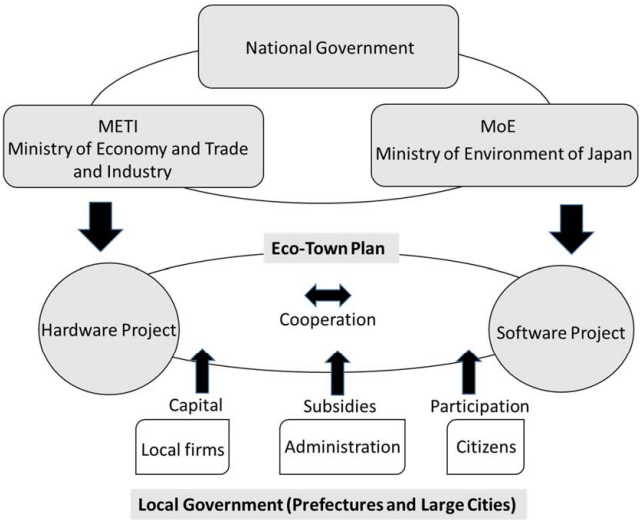

Figure 2: Framework of an eco-town in Japan.
Source: Adapted from Global Environment Center Foundation, "GEC Legal and Other Support Systems for Eco-Towns in Japan".

Eco-Industrial Estate Development in Thailand

Economic growth slowed in the late 1970s in Thailand. There was an urgent need for change in economic strategy from agricultural exports to manufacturing exports. These changes later resulted in creation of industrial estates in various locations in Thailand. Japan started to invest in Thailand through the textile business in the 1960s. By the early 1970s, the rate of Japanese investment in Thailand outnumbered that from the US. Today, Japanese investment is number one in Thailand. Foreign direct investment from January to July 2012 attracted 332.2 billion baht, an increase of 62 percent from 205.2 billion baht of the same period in 2011. During that period, Japan remained the top investor with 474 projects worth 210.8 billion baht, an increase of 120 percent from 97.3 billion baht the last year.[8]

[8] Investment Services Center.

The Japanese economy lost its strength from the early 1990s. Overseas exports were in decline because of the appreciation of the yen and firms moving manufacturing operations overseas to take advantage of cheaper labor costs. Thailand became one of the popular regions for Japanese investors. Thai industries grew with the growing foreign investment. Today, there are 48 industrial estates in operation across 15 provinces in Thailand. Since the economic crisis in 1997, Thailand has been experiencing rapid economic growth with increasing environmental burden. That environmental burden could create difficulties in economic development in the future. Regardless of the sizes of the businesses, almost all of the manufacturers have concerns with their current waste management systems. Thailand needs to speed up eco-industrial estate development in order to minimize environmental pressure caused by industrial activities.

The development of eco-industrial estates (EIE) in Thailand commenced in 2000 under the initiative "The Development of Eco-Industrial Estates and Networks". Five industrial estates were selected as pilot locations for the introduction of various EIE concepts: the Map Ta Phut, Bang Poo, Northern Region, Eastern Seaboard and Amata Nakorn industrial estates.[9] Moreover, the Industrial Estate Authority of Thailand (IEAT) has set a goal to transform existing industrial estates into eco-industrial estates by the end of 2019.[10] Thailand has been receiving international cooperation in implementation of eco-industrial estate development strategies. However, most of the projects have been banished or become stranded in the past since there are still many barriers and difficulties in implementing the concept.

The Japanese government has been working with Thai authorities to introduce Japanese environmental expertise to Thailand. Japanese environmental consulting companies, especially SMEs, are looking for new business opportunities overseas as the market for environmental technologies in Japan have been shrinking. Most of the investment from Japan is in industrial estates. The Amata Nakorn industrial estate is one of the most popular industrial estates for

[9] Verawat, "Development of eco-industrial estates in Thailand".
[10] Industrial Estate Authority of Thailand, "Annual report 2014".

Japanese companies. The Japanese companies targeted Amata Nakorn for business opportunities and the Japanese companies who have participated as OSS project members understand that it is not easy to have the opportunity to work with the Amata Nakorn industrial estate.

Concept of Eco-industrial Estate Development in Thailand

The Thai concept of an eco-industrial estate covers many aspects (physical, economic, environmental, social and management), as shown in Table 3, while Japanese eco-town concepts focus mainly on resource utilization. From this perspective, Thailand cannot just apply Japanese experience of eco-industrial estate development to realize IEAT's concept of eco-industrial estates in Thai industrial estates. Japanese experience will benefit by improving some aspects of the environmental dimension of eco-industrial estates in Thailand. However, Thailand needs to find their own way for other aspects of eco-industrial estate development. In addition to the Amata Nakorn industrial estate project, IEAT has set a goal to transform all the other existing industrial estates into eco-industrial towns by 2019. In 2014, IEAT reviewed and set criteria for eco-industrial development. There are five dimensions and 22 aspects to be considered in eco-industrial estate development, as shown in Table 3.

Table 3: Dimensions and 22 aspects of eco-industrial estates and networks by IEAT. Adapted from Somchint, "Development of Eco Industrial Estates in Thailand".

Specification of standard and criteria for Eco-industrial estate & networks The Ultimate Goal: Pleasant and sustainable co-existence of industry and community 5dimentions and 22 aspects				
Physical dimension	Economic dimension	Environmental dimension	Social dimension	Management dimension
•Landscape/Land use/Green area/Zoning	•Provincial and country economic growth from industrial sectors	•Water Quality •Air Quality •Waste management •Energy Management	•Quality of Life of Employee (Happy Work Place)	•Participatory management
•Eco Design for common utility & Infrastructure	•Economic growth of local area	•Noise Control •Production Process &Product	•Quality of Life of People Surrounding (Happy Community)	•Promotion of Environmental &Safety Management
•Energy Efficiency &Environmental Friendly Building/Green building	•Economic growth of community	•Eco Efficiency •Health & Safety •Transportation •Industrial symbiosis		•Personal Development •Public Disclosure Communication & Report

The Thai concept of eco-industrial estates covers not only environmental management. The environmental dimension emphasizes efficient utilization of resources and energy in the production process, promotion of environmentally-friendly products and waste reduction. The physical dimension focuses on improving infrastructure, public utilities and facilities. The economic dimension aims to promote the local and provincial economy. The social dimension focuses on the well-being of individuals in the organization and community. The management dimension focuses on effective management of the industrial estate.

Eco-industrial estate development in Thailand is in the trial and error stage. Thailand needs to prioritize which dimensions of eco-industrial estates should be developed first and needs further investigation on problems in industrial estates and nearby communities.

Having very broad concepts of eco-industrial development, as opposed to the narrower focus by Japan, will make it more difficult for Thailand to develop a roadmap and transform the Amata Nakorn industrial estate into an eco-industrial estate.

One Stop Service Project: A Case Study of the Eco-Industrial Estate Development Project in the Amata Nakorn Industrial Estate

The Amata Nakorn industrial estate was chosen by the Japanese government to set up an OSS project because: (1) the management team of the Amata Nakorn industrial estate was well motivated and interested in the project; (2) the Amata Nakorn industrial estate was currently operating a subsidiary company to manage waste within the estate so that information gathering could be done smoothly; (3) Amata Nakorn is a large industrial estate and accommodates more than 500 tenant companies and over 300 tenants out of 500 are Japanese companies; and (4) the Amata Nakorn industrial estate, established in 1989, is well recognized in Thailand and was also selected for the Eco-Industrial Estate Development project by IEAT.

Figure 4 suggests that a Thai eco-industrial estate does not just focus on the waste management/recycle aspect as for the Japanese recycle oriented eco-town concept. There are other dimensions and aspects that need to be developed as a whole.

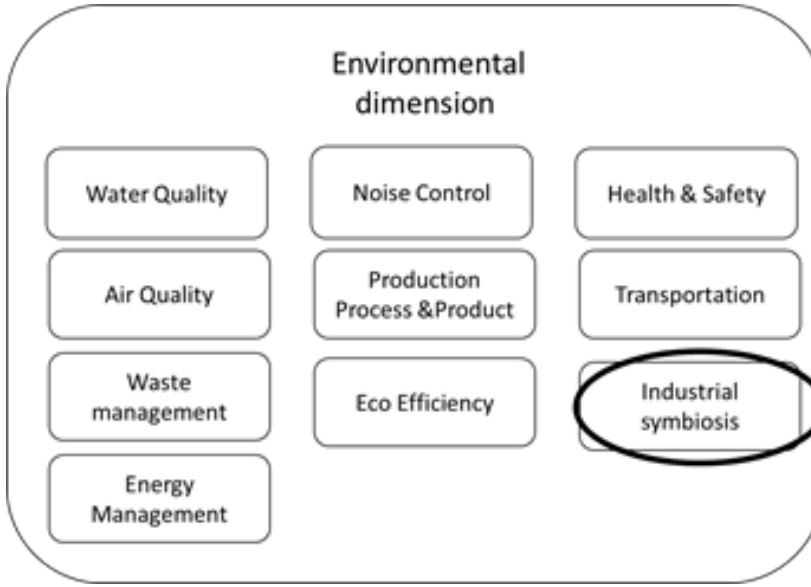

Figure 4: Environmental dimension
Adapted from Somchint,
"Development of Eco Industrial Estates in Thailand".

The OSS project in Thailand is a new project with a new purpose for Japanese participants. While the Japanese eco-town was developed to solve serious environmental problems and revitalize the local economy and the project was led by and subsidized by the government, the OSS business model in the Amata Nakorn industrial estate was mostly planned by Japanese private enterprise to improve the waste management in the Amata Nakorn industrial estate. For the OSS project, the Japanese government funded the OSS preparation project and the Thai government provided support during the project. However, no subsidies were prepared for the actual operation after the OSS preparation project was implemented. When the OSS preparation project started, the project was aimed at improving the waste management of the Amata Nakorn industrial estate and promoting Japanese environmental technologies for commercial purposes.

Challenges in OSS Project Development

There was a gap between the Japanese OSS working team members and the Amata Nakorn industrial estate for project participation purposes. The Japanese goal was to promote the implementation of environmental technologies to the Amata Nakorn industrial estate and establish a business relationship and operate businesses together. On the other hand, the Amata Nakorn industrial estate simply wanted to improve and strengthen waste management within the estate. This was certainly a big challenge for Japan to negotiate and build a consensus about the development plan.

The Japanese side had a few years of preparation to study how to promote Japanese environmental technologies and its related companies into Thailand under the umbrella of the eco-industrial estate development project. This was clearly stated in the Japanese language feasibility report entitled "Feasibility Study on the Development of Sustainable Economy in Bangkok Thailand in 2010".[11] The METI studied how the Kansai regions of Japan could export their environmental technologies under the eco-industrial estate development project in Thailand and Amata Nakorn was chosen for high business potentiality in waste recycle business.

The participation of Japanese companies affected the progress of the OSS project because of business cultural differences. These differences became both strengths and weaknesses of the project development. The Thai side was in the stage of learning and observing how the Japanese concept of eco-industrial estate would be developed in the Amata Nakorn industrial estate.

Strengths

Japanese project members showed their strength in their strong work ethic and hard work, therefore the project made certain progress within a short period of time. Japanese project members utilized their know-how and their expertise for the project planning. The Japanese project members also played a very important role as project leaders

[11] Ministry of Economy, Trade and Industry, "Thai Bangkok".

in developing timelines and the business model for the OSS project. In addition, Japanese project members received sufficient support from their company headquarters in Japan and from the Japanese government. This could be considered the strength of Japanese company participation in the OSS project and an advantage for Thailand to work with Japanese project members.

Weaknesses

However, the Japanese project members encountered certain difficulties that resulted in weaknesses for collaborating among Japanese project members. The daily communication barrier created concerns regarding aspects of business activities. Since communication is among the key factors to building good working relationships with other project members, communication through interpreters was not sufficient. This sometimes caused communication errors and created misunderstanding about the project operation that resulted in delays in the project progress.

Furthermore, the Japanese project members found it difficult to acquire information from tenants, such as waste data, and to understand the environmental and waste related laws and regulations. There are also unwritten social norms in the waste business in Thailand that made it difficult for the Japanese project members to develop a business plan that was fully accepted by all the stakeholders in Thailand.

Recommendations

Participation of the Japanese companies helped strengthen project management, increasing the quality of the business model with Japanese expertise and know-how. On the other hand, there was a communication barrier that reduced the work efficiency of the project members. Difficulties in understanding environmental and waste related laws and regulations and social norms emphasized the business cultural differences between the two countries.

For future project development, the Japanese companies need to minimize their weaknesses and maximize their strengths.

To minimize weaknesses, the Japanese companies and project members need to improve their communication skills and increase the frequency of the meetings. In addition, the Japanese project members need to understand Thai business culture, Thai people and Thai society. By understanding Thai people and Thailand, the Japanese project members will have an idea of how to build good relationships with Thai project members and other stakeholders.

In order to minimize the communication barriers, it is essential to employ or train staff who have a background in environment issues with the language ability to act as an interpreter and assistant the Japanese and Thai project members. That person should be able to explain to Japanese project members the unwritten social norms in the waste business and explain what is acceptable and practical regarding waste related businesses in Thailand. Therefore, the Japanese project members should learn the social and historical background of environmental related issues in Thailand because the laws and regulations are closely related to the history and social and cultural background of how and why each law and regulation were formed and enacted in Thailand.

Conclusion

This study explored how Japanese participation affected the eco-industrial estate development project in the Amata Nakorn industrial estate. While the eco-town concept in Japan was led by the government with subsidies to solve environmental problems and economic downturn, the OSS project in Thailand was mostly led by Japanese private companies to improve waste management for commercial purposes in an industrial estate.

Japanese participation significantly affected progress of the project in some aspects. The Japanese companies brought their expertise in waste management and developed the OSS business model. The Japanese project members also introduced their experience and applied it to the OSS project planning. With their strong work ethic, the project made certain progress in a short period of time. Some weakness from Japanese participation was found mostly in project

operation, with language and communication barriers hindering the daily work activities. There were also difficulties in understanding waste related laws and regulations and social norms. Although the Japanese project members developed business plans by using their expertise, these regulations and social norms forced modification of the OSS business model. This study provided a good source of information about what to expect in international project development between Japan and Thailand and also can help future development of eco-industrial estates in Thailand.

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