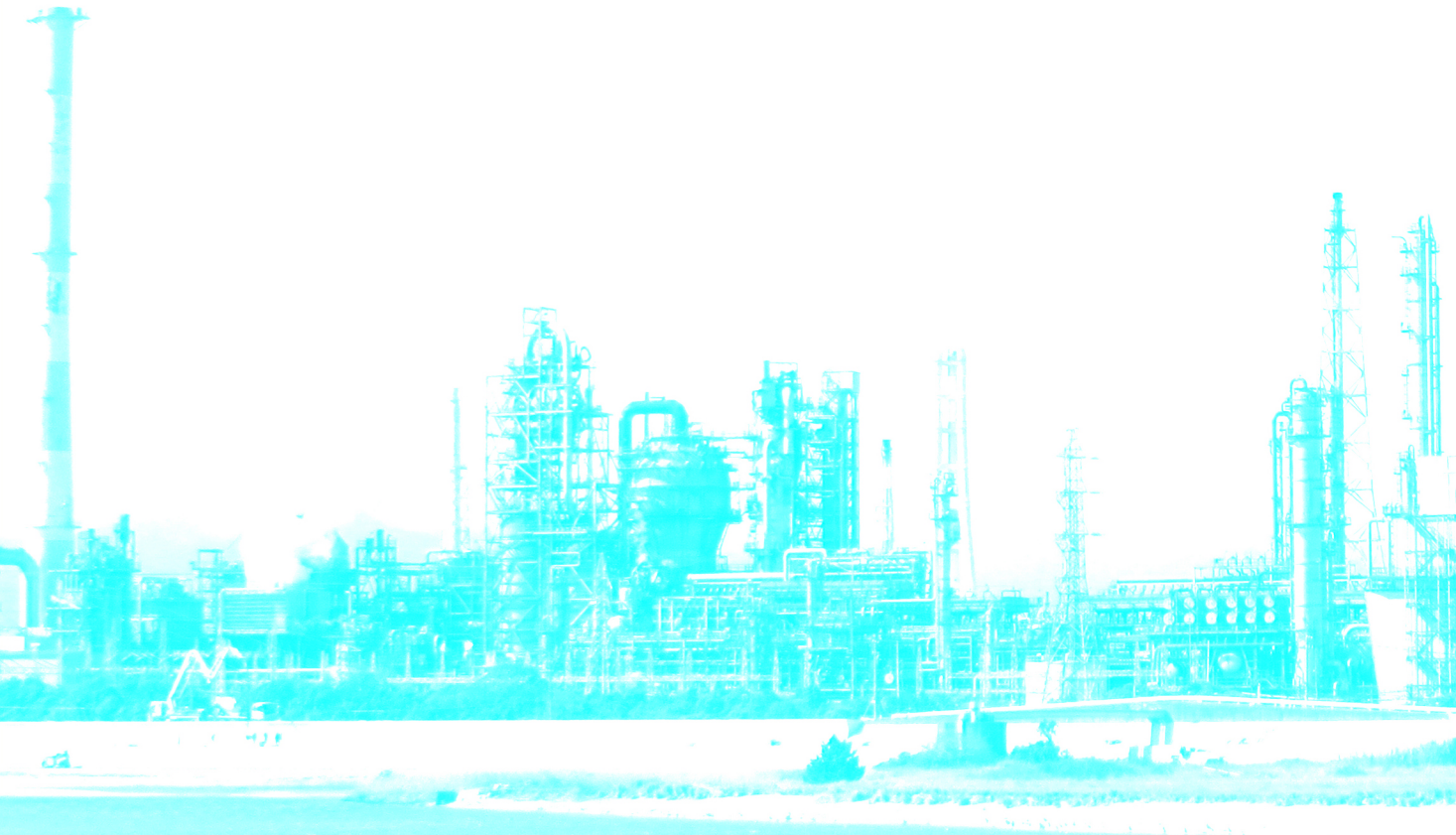
DAWEI DEVELOPMENT ASSOCIATION

2016

Transnational Investments and Responsibility for Social and Environmental Justice:

Lessons form industrial development policies and practices of Japan and Thailand



Zaw Aung

Senior Research Fellow (2013 -2014)
The Nippon Foundation Fellowships for Asia Public Intellectuals
(API Fellowship Program)

Transnational Investments and Responsibility for Social and Environmental Justice:

Lessons from the Industrial Development Policies and Practices of Japan and Thailand

Zaw Aung
Senior Research Fellow (2013 – 2014)
The Nippon Foundation Fellowships for Asia Public Intellectuals
(API Fellowship Program)

Content

Introduction

Transnational investments shifted increasingly from industrialized to industrializing countries when economic globalization accelerated in the late twentieth century. Industrialization has been the only viable choice for developing countries to catch up to the industrialized countries and serves as a dividing line between the terms "developed" and "developing" when demonstrating a nation's economic status. As the world's developing countries mostly exist in Asia and Africa, Japan demonstrated its extraordinary ability to gain the status of the first developed nation in Asia after World War II. Later on, countries in East and Southeast Asia followed Japan's economic growth model to improve their economies, becoming Newly Industrializing Countries (NICs) through transnational investments from industrialized countries into the region. If one tracks the records of both industrialized and industrializing nations, it is clear that industrialization does not simply come with economic prosperity, but it also generates complex social and environmental transformation in societies.

In this context, the research conducts a study of industrial developments in Japan and Thailand as case studies. The former is the industrialized; the latter is the industrializing. The main purpose of choosing Japan and Thailand is the significant flow of transnational investments from Japan to Thailand, starting in the 1980s—the decade in which Japan experienced the double shocks of the rise of Middle East oil prices and the appreciation of the Yen, both of which greatly limited industrial expansion at home and spurred Japan to look for a greener pastures in Southeast Asia. This is when Thailand started to become a favorable destination for Japan's new industrial settlements.

This research takes on three well-known cases in Minamata and Yokkaichi cities in Japan and Map Ta Phut Industrial Estate (MTP IE) in Rayong Province, Thailand. The outbreak of methylmercury water pollution in Minamata Bay was a massive environmental and social tragedy for Japan in mid 1956. This was followed by the air pollution in Yokkaichi known as "Yokkaichi Asthma" in the early 1960s. The industrial pollution in Map Ta Phut emerged with Thailand's industrialization in the mid 1990s. The research explored two main questions: What are the different environmental and social policies and practices used in Japan and Thailand to address industrial pollution? What

lessons can be learned through the correlation of transnational investments and industrial pollution in Japan and Thailand?

Case Study I: Minamata Industrial Pollution in Japan

Minamata disease was caused by one of the worst environmental pollution disasters in the postwar history of Japan. Minamata was a small fishing village located in Minamata Bay, in the southernmost part of Kumamoto Prefecture on Kyushu Island. The disease was first discovered on May 1, 1956. The cause of the disease was methylmercury effluents discharged by Nippon Chisso Hiryo Kabushiki Kaisha (now renamed JNC Corporation). Fifty-eight years later, nobody knows how many people exactly have been poisoned by eating contaminated fish and shellfish from Minamata Bay due to the lack of a comprehensive environmental and health impact assessment in the affected area. More than one thousand victims died of methylmercury poisoning and many thousands living in the communities of Minamata Bay and Yatsushiro Sea were seriously affected. Most have never been officially recognized as victims under the government's strictest criteria. Today, only 2,275 victims are certified as patients, while 65,151 victims are still waiting for the government to recognize them as Minamata disease patients. Many have died waiting for certifications (MOE 2013, 14).

Photo: *Ms. Shinabu Sakamoto, who suffered Minamata Disease before she was born, is now 58 years old and her 90-year-old mother Mrs. Fujie Sakamoto. The photo was taken during the field research in Minamata City.*

The disease even affected pregnant women who ate methylmercury contaminated fish and shellfish that poisoned their unborn babies. In the early 1960s, "the umbilical cords of some mothers were found to have high amounts. Researchers later became aware of this because some families in Minamata saved umbilical cords as part of a traditional birthing ritual and scientists later tested them at the laboratory" (Walker 2010, 150). Mrs. Fujie Sakamoto was one of those mothers. She is now 90 years old. Her daughter, Ms. Shinabu Sakamoto was born with the disease and is now 58 years old. The case of the Sakamoto family represents the irreparable damage of innocent local residents due to the reckless pursuit of profits by industrial polluters and the government's irresponsibility and negligence to address the problem in due time and with due diligence. Japan's Ministry of Environment confessed: "The government failed to prevent damage by Minamata disease from increasing" (MOE 2013, 6). Minamata disease is an unforgotten tragedy that still haunts the city today.

Japan's Postwar Industrialization and Environmental Pollution

Japan's postwar economic conditions and industrial policies serve as key factors to understand why Japan tolerated environmental pollution to rebuild its war-torn nation after the Second World War. The demobilization of Japanese military forces after the war and the heavily destroyed economic infrastructure nationwide caused a sharp rise in the unemployed population, which reached 13.1 million at the end of the war (Takafusa 1993, 23). Moreover, the Supreme Commander for the Allied Powers (SCAP) controlled both Japan's postwar policy formulation and law making process until full authority was returned to the national government in 1952. An important component of SCAP's restructuring of the economy was disbanding the "Zaibatsu" (or "wealth clique") system that monopolized the pre-war economy and supported Japan's expansion during the war. Chisso was a member of the Zaibatsu as the leading conglomerate in Japan's chemical industry. It had a very close relationship with the military and expanded its factories in China and Korea during the war (Ui 1992, 105–108). Despite losing 80 percent of its assets during the war, the company was astonishingly revived like the legendary Phoenix from the ashes under the economic policies of the post-war Prime Minister Yoshida, who formed the Economic Stabilization Board (ESB), initiated a policy called Priority Production System (Keisha seisan Hoshiki), and rebuilt Japan's industrial power within a decade (Hironori 2013, 121–126).

Acetaldehyde Production: The Source of Minamata Disease

In the postwar Japanese economy, Chisso Corporation remained a flagship company in Japan's chemical industry and enjoyed the government's support and protection. "Government economic policies, giving special emphasis to the expansion of the chemical industry to meet the brisk demand for nitrogen fertilizers and organic chemicals, fueled a sharp production rise at the rebuilt Minamata plant…Two 'big growth' chemicals at the core of Chisso's operations were polyvinyl chloride and acetaldehyde, used in the production

of plastics" (Huddle and Reich 1987, 103–104). Chisso's acetaldehyde production in postwar Japan rose double to triple fold in fifteen years,, from 2,400 tons in 1947 to 39,600 tons in 1960 (Gresser 1981, 90). A sharp rise of acetaldehyde production meant a sharp rise in using mercury as a catalyst in the production process.

Yet, Chisso never admitted to the use of mercury until the government officially revealed it in 1968. In fact, the early warnings of pollution in Minamata Bay were shown as early as in the 1920s. "Human disease caused by pollution never breaks out all of a sudden. They are preceded by long-term changes in the environment. This can be said of Minamata as well" (Harada 2004, 15). In 1925, Chisso began receiving complaints from Minamata's fishermen's cooperative, and had to give the first compensation to the fishermen due to the factory's effluents destroying the fishery resources in the bay.

Photo: *It shows the location of the chemical factory owned by Chisso Corporation, million tons of methyl mercury-contaminated sludge buried under the reclaimed land, and the sewage channel directly connecting between the factory and Minamata Bay*

A Chronological Study of Minamata Disease and the Lessons to be Learned

Despite the difficulty of drawing a timeline of the major events associated with Minamata disease, this study attempts to conduct a brief chronology to understand the

tragic history in four major dimensions: 1) early pollution warnings in Minamata Bay; 2) the discovery of Minamata disease and responses from Chisso and the government; 3) lawsuits against Chisso and the government; and 4) relief measures for Minamata disease patients.

In the first dimension, upon carefully reviewing Chisso's activities during the period of 1925–1956, one will find that early warning signs showed the danger of water pollution in Minamata Bay since 1925. During World War II, Chisso expanded its chemical production to supply the demands of the Japanese military and its colonies such as China and Korea. Therefore, a clear correlation between Chisso's business expansion and pollution in Minamata Bay can be seen.

In the second dimension, the timeline begins with the discovery of Minamata disease in 1956 and ends with Chisso putting an end to the use of mercury as a catalyst in acetaldehyde production in 1968. Several studies on Minamata disease point out that the Japanese government directly or indirectly protected Chisso despite the methylmercury poison tragically spreading across sizable geographic areas within Kumamoto and Kagoshima prefectures. The most complicated issue was identifying the symptoms as they manifested differently and at different levels, making it extremely difficult for the medical scientists at Kumamoto University to come to a consensus as to the cause. Despite these circumstances, the government never compelled Chisso to disclose its production methods, forcing Kumamoto University's medical scientists to conduct their own research and find the cause of the disease on their own. Finally they unanimously agreed that methylmercury was the cause of the disease.

In the third dimension, the verdict of the Kansai Lawsuit1[1] in 2004 stated that the government failed to take necessary actions against Chisso through the enforcement of the existing laws. Therefore, the government was to be blamed for its irresponsibility and negligence because secret documents submitted to the court revealed that it knew that Chisso effluents were the cause of the disease (Upham 1987, 34). Given that Minamata disease was officially discovered in 1956, the government successfully avoided its legal responsibility for at least 48 years. The government's strategy to deal with the problem was to launch a 48 billion Yen project to remove 1,500,000 cubic meters of methylmercury-contaminated sediments from the bay, bury them underneath reclaimed land (Environmental Health Department 2002), and announce that the bay was safe in 1997.

In the fourth dimension, the evidence showed that the government tried to address the problems by enacting and enforcing several laws, but its policies to protect the company first, to clean the bay second, and to relieve the hardships of the victims last drew strong criticism of the government's treatment of the victims. "Despite the great possibility of environmental and health damage, a pollution control policy was not accepted by the government and industry during the 1950s, according to a narrow economicoriented

1. Kansai Lawsuit (2004): www.courts.go.jp/english/judgments/text/2004.10.15-2001-O-Nos..1194.and.1196%2C.and.2001-Ju-Nos..1172.and.1174.html

development policy" (Kazuhiro 1995, 55). To date, the victims of Minamata disease continue to seek social and environmental justice and the case remains unfinished.

Early Pollution Warnings at Minamata Bay	Period (1925 – 1954)												
	25	26	32	43	49	52	53	54	55	56			
Chisso's 1st solatium payment to fishermen cooperative													
Chisso begins acetaldehyde production in 1932													
Chisso's 2nd solatium payment to fishermen cooperative													
Chisso's unresolved dispute with fishermen cooperative													
Cats die after showing symptoms of Minamata disease													
Mice die after showing symptoms of Minamata disease													
A patient with unknown disease dies at Chisso Hospital													
A patient with unknown disease dies at Chisso Hospital													
Fishery resources decreased to one-third what they were before World War II													

The Discovery of Minamata Disease and Responses of Chisso and the Government	Period (1956 – 1968)												
	56	57	58	59	60	61	62	63	64	65	66	67	68
Discovery of the first Minamata disease patient													
1st Medical science hypothesis: Manganese													
2nd Medical science hypothesis: Selenium													
3rd Medical science hypothesis: Thallium													
4th Medical science hypothesis: Organic Mercury													
Scientific confirmation of methylmercury as pollutant													
Discovery of congenital Minamata disease													
2nd Minamata disease outbreak in Niigata Prefecture													
Government recognizes methylmercury as pollutant													
Chisso stops using mercury to produce acetaldehyde													

Lawsuits against Chisso and Government	Period (1969 – 2013)												
	69	73	85	01	04	10	12	13					
1st lawsuit in Kumamoto district court													
2nd lawsuit in Fukuoda district court													
3rd lawsuits in Osaka high court (Kansai Lawsuit)													
4th lawsuit in Kumamoto, Tokyo and Osaka courts													
5th lawsuit in Osaka high court													

Relief Measures for Minamata Disease Patients	Period (1969 – 2014)												
	69	73	74	77	78	79	95	09	10	12	13	14	
Enactment of the Relief Act[2]													
Compensation disbursed under the 1969 Relief Act													
Enactment and enforcement of the Compensation Act[3]													
Certification criteria for acquired Minamata Disease													
Enactment and enforcement of the Certification Act[4]													
Cabinet "Measures to Deal with Minamata Disease"													
Enactment of the Relief and Solution Act[5]													
Application for certification closed													
Screening 65, 151 victims for certification is underway													

Table 1: *A Brief Chronology of Minamata Disease Caused by Methylmercury Water Pollution*
Sources: *Gresser 1981, Huddle and Reich 1987, Ui 1992, Harada 2004, MOE 2013*

Given the above chronological study, this research concluded three points. First, the Japanese government delayed legal means to ban the use of mercury in acetaldehyde production for twelve years. Second, although it was natural that many countries practiced the policy of protectionism for business interests, the negligence of the Japanese government to protect the lives of the people in the case of Minamata was unbelievable and ethically unacceptable. Third, financing Chisso to avoid bankruptcy and practicing the strictest criteria for patient certifications resulted in the continued growth of the company and thousands of uncertified patients.

Case Study II: Yokkaichi Industrial Pollution in Japan

The city of Yokkaichi is located in Mie Prefecture, 40 km southwest of Nagoya City. Geographically, Yokkaichi lies between the Suzuka mountain range to the west and Ise Bay to the east. Yokkaichi was a town of textile and ceramic factories in the late nineteenth century (ICETT 2010). Before World War II, Japan built the country's second naval fuel depot in Yokkaichi. Since then, Yokkaichi was gradually transformed from the center of the light manufacturingindustry toward the heavy petrochemical industry. During

2. Act on Special Measures Concerning Relief for Health Damage by Pollution
3. Act Concerning Compensation and Prevention of Pollution-Related Health Damage
4. Act on Temporary Measures Concerning Facilitation of the Certification Work for Minamata Disease
5. Act on Special Measures Concerning Relief for Victims of Minamata Disease and Solution to the Problem of Minamata Disease

World War II, Yokkaichi's naval fuel depot also became a target of the US Air Force. After the war, the occupation forces permitted the reopening of oil refineries along the Pacific Coast as part of economic reconstruction in 1949, and the operation of oil refineries began in Yokkaichi City in 1957 (Gresser 1981, 108109).

Soon after the full operation of the industry complex in 1959, local residents started to face air pollution due to the emission of chemical gases from the newly-constructed petrochemical complex in 1960. After a significant rise of respiratory diseases in Isozu District, adjacent to the industrial complex, the Yokkaichi City government sought the help of Mie Prefecture University's medical research team led by Professor Yoshida to measure pollutants and conduct epidemiological investigations to identify the various respiratory diseases, including chronic asthma. Later, Yokkaichi Asthma became known as one of "Four Big Pollutions" in Japan. "Since consideration given to environment was lacking in such great expansion of industrial production, serious environmental problems were caused such as Yokkaichi Asthma" (Yoshida 2007, 264, Feng and Hashimoto 2012, 214).

Today, Yokkaichi is one of the major business districts located between the two major economic centers of Chubu and Kansai, the two industrial centers in Japan. Since 2007, Mie prefectural authorities transformed the city to be the hub of cutting-edge enterprises under the "Three Valleys" concept: "Crystal Valley" (flat-panel displays and other LCD technologies), "Silicon Valley" (semiconductors and IT), and "Medical Valley" (medical care, health, and welfare) (JETRO 2007, 5). However, the citizens of the city did not forget their past nightmare of air pollution and therefore set up the Yokkaichi City Environmental Study Center, where this research conducted a study on the city's past and present.

A Chronological Study of Yokkaichi Asthma and Lessons to be Learned

Similar to the study of Minamata Disease, the research conducts a brief chronology to understand the Yokkaichi air pollution history in four major dimensions: 1) investigation of air pollution; 2) legal framework development to address air pollution at Yokkaichi Industrial Complex; 3) relief efforts for pollution-affected patients; and 4) lawsuits against six polluter factories (see Table 2). This study discovered that the development of the legal frameworks and enforcement initiated by the Mie Prefecture government were key factors in addressing the Yokkaichi air pollution. However, the brief chronology shows that as in other pollution cases, it took more than a decade to find the right legal framework to effectively address the pollution problem in Yokkaichi. In the case of Yokkaichi, the city government actively sought to address the air pollution soon after they were first aware of the pollution-related health problems among the local residents, especially in Isozu District.

According to the chronology in Table 2, the Japanese government took five years (from 1962 to 1966) attempting to control air pollution through the Soot and Smoke Regulation, but it failed. In 1967, the government enacted the "Basic Law for Environmental Pollution Control," which decentralized power and allowed local governments to independently practice stricter regulations based on the needs of each region. Using this decentralized power, Mie Prefecture enacted the Mie Prefecture Pollution Control Ordinance, which was stricter than the national standards. In 1968, Japan introduced its first air pollution law called the "Air Pollution Control Law." The key aspect of this law is to control ground concentration of pollutants known as "K-value control." This encouraged factories to build taller smokestacks. It resulted in a rapid decline of SO2 concentration near the factories, but the pollutants were spread to a wider area.

Incidents	Period (1961 – 1973)												
Investigation of Air Pollution	61	62	63	64	65	66	67	68	69	70	71	72	73
Examining pollution level in thirteen districts													
Patients increase from 2 to 66 patients after industrial operations begin													
Examining 9,000 people in six districts													
Examining 738 students from public schools													
Legal Framework Development to Address Air Pollution at Yokkaichi Industrial Complex													
Soot and Smoke Regulation Law Enactment													
Yokkaichi as target area under Soot & Smoke Law													
Soot and Smoke Law enforced in Yokkaichi													
Basic Law for Environmental Pollution Control													
Mie Prefecture Pollution Control Ordinance													
Air Pollution Control Law													
Areawide Total Pollutant Emission Regulation System													
Relief Efforts for Pollution-affected Patients													
Public relief system established													
Government and factories responsible for relief system													
Pollution-related Health Damage Special Measure Law													
Pollution- Related Health Damage Compensation Law													
Lawsuit against Six Polluter Factories													
Nine patients file a lawsuit against six polluters													
Patients win in court													

Table 2: *A Brief Chronology of the Yokkaichi Air Pollution Problem*

Sources: *Gresser 1981, Yoshida 2007, ICETT 2010, and Feng and Hashimoto 2012*

Photo (Left): *Wind direction from Yokkaichi Industrial Complex No. I to Isozu District*
Photo (Right): *A tall smokestack to dilute SO2 emissions at Yokkaichi Industrial Complex No. I*

In 1972, after previous pollution control measures proved unresolved, the Mie Prefecture government amended the Mie Prefecture Pollution Control Ordinance to introduce a new regulatory system called "Area-wide Total Pollutant Emission Regulation System," limiting SO2 concentration in a specific area. Under the new system, all factories must follow the area-wide emission standard (0.017 ppm) imposed by the Mie Prefecture government, no matter how many smokestacks exist in the area. This system proved effective in significantly reducing air pollution and respiratory diseases in Yokkaichi City. Later on, the system became a model and was incorporated into the national regulations. Apart from the enforcement of the right regulation, the advancement of desulphurization technology to reduce the sulphur content in the fuel was introduced in the industrial factories (ICETT 2010).

However, the polluters were still free from any legal responsibility to the victims who have shouldered immense financial burdens for the respiratory diseases caused by the pollution. "Improvement of clinical conditions can not be expected where air pollution continues. Recurrent asthmatic attacks caused numbers of shocking incidents of suicide. As a result, a great number of people insisted that a powerful social movement was necessary for the elimination of air pollution" (Yoshida 2007, 273). In September 1967, citizen campaigns against Yokkaichi pollution began with a lawsuit against the six polluting factories filed by nine respiratory disease patients in Isozu District.

On July 24, 1973, the Yokkaichi District Court judged that the combined soot and smoke from the six defendants' factories (namely Mitsubishi Monsanto, Mitsubishi Kasei, Mitsubishi Yuka, Shoseki Oil Refinery, Ishihara Chemical Fertilizer, and Chuden Power Plant) were the main sources of pollution in Isozu District and they were jointly liable to pay a total compensation of 88 million Yen to the plaintiffs. Registration and compensation have been carried out since 1965; no new cases have been reported in Yokkaichi since 1988. Records show that 1,354 patients registered in Yokkaichi City during 1965–1988. As of December 30, 2002, 714 out of 1,354 patients had died. (Yoshida et al. 2007, 272; Imamura 2007, 225; and Guo et al. 2008, 2).

Given the above chronological study, the research concluded that "Yokkaichi Asthma" became a success story in the history of the Japanese government's fight against pollution problems in Japan. This was mainly due to the decentralization policy of enforcing different pollution standards and regulations from the central to the prefectural levels and the brave initiatives of the Mie Prefecture and Yokkaichi City governments.

Case Study III: Map Ta Phut Industrial Pollution in Thailand

Thailand faced a critical economic recession in the early 1980s, but the situation totally changed at the end of that decade and the country emerged as the first Newly Industrializing Country (NIC) in the Mekong region in the early 1990s (Phongpaichit and Baker 2002, 147–184). This was largely due to a significant influx of transnational investments into the country's industrial sector and a consequent rise in industrial exports from Thailand. Thailand's major economic policy change from import substitution to export orientation promoted the export of industrial products. To support the new policy, the Thai government extensively developed basic industrial infrastructure before it launched the Eastern Seaboard Development Plan as the prerequisite to make effective use of transnational investments. Dixon analyzed: "Thailand's remarkable decade of growth was presented as the product of liberalization, deregulation and opening of the economy…the Kingdom comprised a new model of development for the countries of the Third World as a whole" (Dixon 1999, 440). Behind the economic growth of Thailand, Japan was a major country that helped develop the country's industrial infrastructure. According to Thailand's Provincial Data (2012–2013), Thailand's international trade value in 2011 was more than 2 trillion Baht and Japan was the most important trade and investment partner (Alpha Research 2012, 22).

As a result, Pasuk Phongpaichit and Chris Baker analyzed:

> *"For many years, Japanese economists had predicted that the Japanese economic miracle would radiate across Asia in this way, rather like England's industrial revolution had radiated out through neighboring Europe…These economists described the process with an image of flying geese. Japan headed the echelon. From the 1960s, the Tigers started flying in Japan's wake. They copied some of Japan's strategies and they benefited from some Japanese investment. Now in the 1980s another set of countries [Thailand, Malaysia, etc.] was being tacked onto the back of the flight" (Phongpaichit and Baker 1998, 3).*

However, industrial development does not bring only economic benefits to developing states, but it can also bring a number of challenges in social and environmental areas. The industrial infrastructure development completely changed the environmental conditions and social structure in the society with subsequent impacts on human life and

livelihoods. Thai citizens experienced these challenges along with the industrializationof the 1980s–90s. This research selected Map Ta Phut Industrial Estate (MTP IE) as a case study.

Map Ta Phut: From the Land of Tapioca to a Heavy Industrial Zone

Prior to the development of the industrial zone, Map Ta Phut was a village full of tapioca, then a major cash crop in the region. The transformation of the area into a hub of the heavy petrochemical industry came with the introduction of the Eastern Seaboard Development Plan (ESDP). The plan's concept of "growth decentralization" aimed to reduce the heavy concentration of industrial settlements in the Bangkok metropolis. The main favorable condition to setting up aheavy industrial estate at Map Ta Phut was the discovery of a natural gas reserve nearby in the Gulf of Thailand in the early 1970s (CIPO 1982). To materialize the ESDP, Japan not only provided the technical assistance to design, plan, and implement various infrastructure development projects, but also offered a huge package of Official Development Assistance (ODA) to Thailand in the 1980s and 1990s. As of July 1999, Thailand had received a total of 133.80 billion Yen in Japanese ODA loans for sixteen infrastructure projects of the ESDP (JBIC 2001, 11). The industrial infrastructure of the ESDP was impossible without ODA assistance from Japan (see Table 3).

Project	Completed Year
Water Pipeline from Dok Krai Reservoir to MTP IE	1984
1st Gas Separation Plant	1985
Chachoengsao – Sattahip Railway (140 km)	1987
Sattahip – Map Ta Phut Railway (24 km)	1993
Petrochemical Complex	1989
Downstream Project (HDPE/LLDPE/LDPE/VCM/PP)	1989
2nd Gas Separation Plant	1990
1st Phase of MTP Industrial Deep-sea Port	1992

Table 3: *Early Infrastructure and Industrial Development in MTP (1984–92)*

Sources: *CIPO, NESDB (June 1992), JBIC (March 2001)*

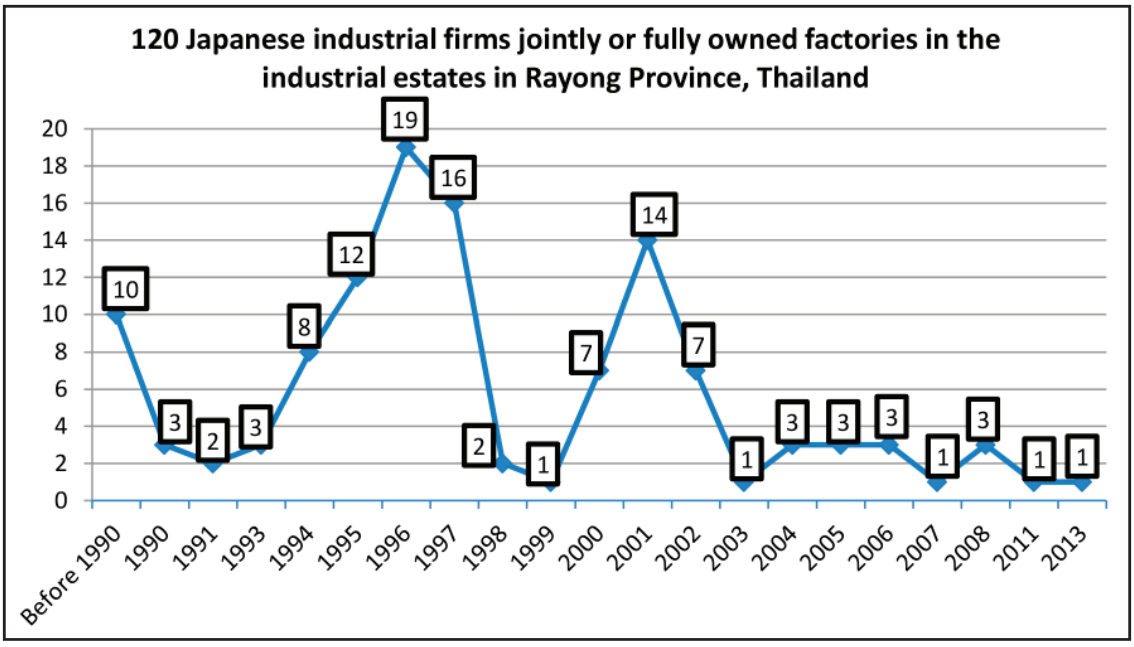


Figure 1: *Japanese Investment Flow into the Industrial Estates in Rayong (Number of New Factories by Year)*

Source: *Japan–Thailand Trade Directory, Wesley Publishing Co. PTE Ltd (2013)*

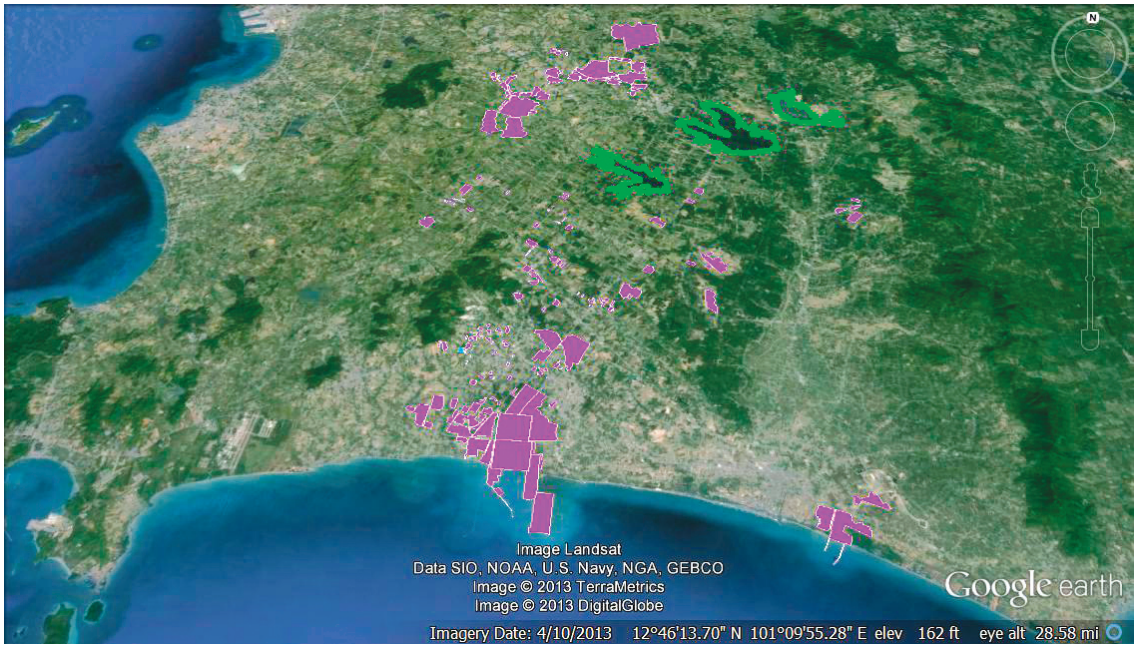


Figure 2: *Expansion of the Industrial Estates from the Seafront to Northern Inland Areas in Rayong Province*

Source: *Google Earth survey done by the author based on different maps from the ESDP Major*

Industria Estates *Water Reservoirs: Dok Krai, Nong Pla Lai, and Klong Yai*

Japanese industrial firms played a major role in the Map Ta Phut Industrial Estate (MTP IE) by moving their industrial factories from Japan. The Japan–Thailand Trade Directory published by Wesley in 2013 lists over 2,500 Japanese affiliated companies investing in Thailand, mostly in the manufacturing sector. As shown in the Figure 1, there were only ten factories jointly or fully owned by Japanese companies in Rayong before 1990. Over the past two decades this number has increased to 120 companies. As Thailand received a massive influx of billions of US dollars in transnational investments, particularly from Japan, the MTP industrial zones expanded from the seafront to the northern inland area to create a total of eleven industrial estates[6]. Three major reservoirs, Dok Khai, Nong Pla Plai and Khlong Yai, provide fresh water to the industrial estates through a network of water pipelines in Rayong. The expansion of the industrial estates and the locations of the water reservoirs are mapped out below.

Thai Government's Failure to Address Pollution Problems at MTP IE

The state of pollution has been deteriorating in Map Ta Phut since the early 1990s. The Pollution Control Department (PCD) report "Thailand State of the Environment: The Decade of 1990s" stated that air quality problems at MTP IE were not due to sulphur dioxide, nitrogen dioxide, or carbon dioxide, but to Volatile Organic Compounds (VOCs), which seriously harm the public health (PCD 2000, 35). The 2005 report "Thailand's Air: Poison Cocktail" identified a high level of twenty toxic VOC compounds in the air and identified Map Ta Phut as the number one toxic hotspot in Thailand (Buakamsri 2005, 23–53). The PCD confirmed that they also found the same number of VOCs around MTP IE (PCD 2006, 96). In 2010, the PCD reported: "When comparing the average annual values during 2008–2010, it was found that concentration levels of Benzene rose in 2010" (PCD 2010, 5). In 2011, UNESCO Bangkok reported: "Testing of water samples obtained from 25 public ponds in the Map Ta Phut municipality indicated the existence of hazardous levels of toxic substances. Cadmium was 6 times the safety level, zinc 10 times, manganese 34 times, lead 47 times and iron 151 times" (UNESCO 2011, 14). From the fifth to the ninth National Economic and Social Development Plans, the Thai government acknowledged the worsening pollution problems, but failed to translate policy rhetoric into actual implementation (NESDB 1981, 111, NESDB 1986, 321, NESDB 1991, 41 and 177, NESDB 2001, 62). All these research documents clearly showed that Thailand failed to address the pollution problems in Map Ta Phut even though the responsible government agencies identified the problems of VOCs and took some measures to address them.

6. 1) Map Ta Phut IE; 2) Hemaraj Eastern IE; 3) Padaeng IE; 4) Asia IE; 5) Hemaraj Rayong Industrial Land (Hemaraj RIL); 6) Hemaraj Eastern Seaboard IE; 7) Eastern Seaboard IE (Rayong); 8) Amata City IE; 9) Siam Eastern IE; 10) GK Land Industrial Park; and 11) Rojana Industrial Park.

Litigations against Thai Government Agencies and Cynical Solutions

In 2009, the local residents sued the National Environmental Board in Rayong Administrative Court for its failure to declare Map Ta Phut a "pollution control zone" and its negligence to abide by Paragraph II of Section 67 of the Constitution. The two lawsuits were decided in favor of the communities, and all of the 76 new industrial expansion projects were suspended. The projects were not to be restarted and business licenses not to be issued until environmental andhealth impact assessments (EHIA) were carried out and public hearings conducted. The verdict blocked new investments from Japanese firms that had a big stake in eleven of the 76 projects. Mr. Sorayut Phettakul (Phettakul 2010, 9), the then Vice Minister for Industry of Thailand, flew to Tokyo in March 2010 to restore the confidence of the Japanese investors and promised to reopen the suspended projects during the "Seminar on Investment Outlook in Thailand on Map Ta Phut Issue." A few months later, in 2010, the Central Administrative Court overturned its own verdict, allowing 74 of the 76 projects to continue their construction and operate in Map Ta Put Industrial Complex.

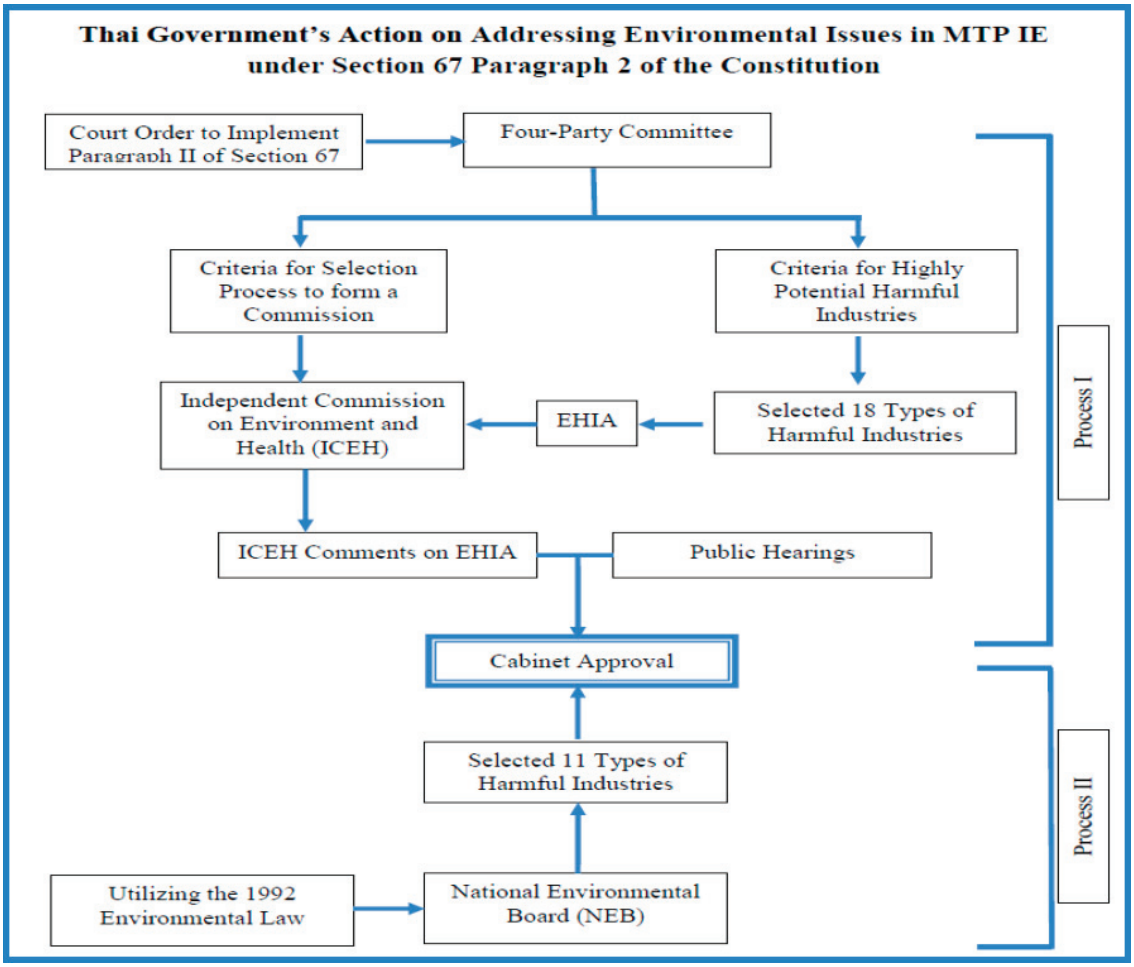


Figure 3: *Thai Government's Action on Addressing Environmental Issues in MTP IE under Section 67 Paragraph 2 of the Constitution*

Source: *Interviews with Four-Parties Committee Members*

To implement Section 67 Paragraph II of the Constitution, the Thai government appointed former Prime Minister Mr. Anand Panyarachun to form an independent committee known as the "Four Parties Panel." It consisted of public agencies, private sector actors, academics and civil society representatives. The independent committee submitted a list of eighteen types of harmful projects, but the government sidelined the committee's proposals and introduced an alternative proposal to legalize eleven types of harmful projects (see Figure 3). According to interviews with key informants from the Four Parties Panel, if the government had accepted the seven types of harmful industries that they rejected, most of the 76 projects would be required to follow the process outlined by Section 67 Paragraph II of the Constitution. This would result in project delays to accommodate conducting assessments and a series of public hearings, discouraging investor confidence and greatly affecting the investment climate of Thailand. That is why the committee members believed that the Thai government cynically introduced an alternative plan to bypass the long process of implementing Section 67 Paragraph II of the Constitution and reopened the suspended projects within one year.

Conclusion: Lesson Learned from Japan and Thailand

In this section, the research analyzes why a country failed to learn lessons from another's mistakes and continued to repeat the mistakes in their own industrialization process. First, the politics behind the industrialization policies were the underlying factors that caused the environmental destruction in Japan and Thailand. Second, both governments placed economic "high growth" as a policy priority above all, causing damage to the environment and public health. Third, the enforcement of environmental laws and regulations always came only after the outbreak of serious environmental problems that caused wider public discontent and social movements. In the following, the research summarizes the lessons learned from the findings of the three case studies in Japan and Thailand.

Transnational Investments and Responsibility for Social and Environmental Justice

Due to the complex web of industrial estate management (for example in MTP IE), wherepowerful multinational corporations from many countries are involved, it is extremely difficult to single out one factory or a group of factories that are accountable for the social and environmental problems and bring them to justice whenever serious pollution breaks out in an industrial estate today. It is also challenging to enforce national regulatory frameworks, especially those that require industrial firms to take legal responsibility for social and environmental justice.

Industrialization in the Absence of Pollution Protection Laws and Mechanisms

Japan began to enact environmental laws and regulations only in the 1960s, after serious environmental problems in Minamata and Yokkaichi. Thailand sought Japanese financial assistance and technical expertise for industrial development in Map Ta Phut without taking into account the serious industrial pollution problems that had occurred in Japan and without developing proper environmental protection mechanisms specifically designed to control industrial estate pollution. This is because in order to attract more foreign direct investment (FDI) and encourage economic growth, governments, particularly in developing countries, are too reluctant to impose stricter environmental regulations on foreign firms. Therefore, rapid industrialization has continued in parallel with the absence of laws and mechanisms to protect against environmental pollution not because of the lack of knowledge, but because of the negligence of governments to develop preventive and protective laws and mechanisms.

Contradictions between Industrial Policies and Environmental Responsibility

The complex roles of central and local governments created the question of who had the primary responsibility to address the pollution outbreaks when they happened. This made the problems worse due to the delay in administrative responses. Japan allowed local governments to impose stricter pollution standards, but Thailand centralized the development of the legal framework, leaving provincial authorities littleauthority. More importantly, the central governments usually controlled the revenues of the industrial estates and limited the capacity of local governments to address the pollution problem.

Secrecy of Industrial Information and Deepening Pollution Problems

The most important factor in the inability to control pollution outbreaks was the acute deficiency of industrial information about the industries and their production processes. When pollution outbreaks happened in all three case studies, the defense line of the polluters was to demand scientific evidence of the direct linkage between the pollutants released by the factories and the health problems of the local communities. However, the most agonizing experience was that the industries were protected by laws to keep their production process information secret; suspected factories therefore did not provide information or cooperate with scientists to find the source of pollution.

The Importance of Scientific Research to Redress Pollution Problems

Pollution never happened suddenly, but rather emerged due to the adverse effects of long-term discharging of hazardous industrial wastes into the air or water. When adverse effects became apparent, scientists from relevant fields of studies had to search for the source of pollution. The urgency and importance of scientific research is so tremendous because early diagnosis can control the spread of the pollution quickly, causing less human casualties. Also, scientific findings have the multiple benefits of contributing to developing laws and regulations, improving pollution control technologies, addressing public health problems, and adding to evidence in lawsuits against the polluters. Such scientific knowledge can also be applicable to other similar cases beyond the national boundary.

Anti-Pollution Campaigns against Government Industrial Policies

The pollution victims experienced multiple hardships: deterioration of their health, loss of livelihoods and incomes, and long difficult battles against irresponsible polluters and the government. Eventually, the distrust between the polluters and government on one side and the pollution-affected communities on the other side in all three cases deepened to the level that the victims felt their suffering was totally discarded. This convinced them to launch anti-pollution campaigns to seek wider public support for their problems. These activities became legitimate under the concepts of social and environmental

justice. However, in seeking social and environmental justice, the path of social movements was not always straightforward due to confrontations with the industrialists and government agencies that have financial and political powers and the daily need to disproportionately bear the burdens of pollution such as healthcare costs and lack of income.

Manipulation of Legal System to Handle Social Movements

Social movements often aggravated the already existing social hardships of the victims in the long legal battles against the polluters. Thailand's case study is the best example of how the government manipulated the legal system. The Thai government's real intention was not to follow the Constitution but to overturn the Supreme Court's order to suspend new industrial projects and expand the MTP IE for more transnational investments, leaving social movements in dismay. In the case of Japan, if the courts judged in favor of the victims, the polluters and government respected the court verdicts to compensate the victims, but carried out lengthy negotiations to determine the amount of compensation outside the court. The polluters in Japan not only provided a lump sum in compensation for the deaths and to the survivors, but also provided lifelong pensions to those who were physically and mentally affected, and were not able to return to a normal life.

International Legal Mechanisms and Transnational Investment-related Pollution

The responsibility for environmental pollution created by foreign industries in developing countries is far more complicated than ever due to the complex web of transnational investment flows from the developed to developing countries. Although there are multilateral and bilateral dispute settlement mechanisms for transnational investments, there is no international mechanism to address social and environmental problems caused by transnational investments in developing countries. Instead, national governments have to take full responsibility to address these problems within national legal frameworks and such a challenge is still limited to the national boundaries.

At this point, there is a dilemma on whether to tighten environmental standards, which the transnational investors dislike, or whether to relax these standards, which the local citizens dislike. The lack of policy clearness to address this dilemma is causing environmental pollution. Yet although the cost of social and environmental justice is extremely high, it has became such a societal problem that governments can no longer ignore the challenge. The cost that the Japanese government paid to recover its industry-polluted environments and compensate the affected societies across the nation amounted to hundreds of billions of dollars, an amount potentially higher than the national budget of a poor nation in Africa or Asia. Definitely, a developing country like Thailand cannot afford to spend its national budget for the huge social and environmental costs of industrialization for the sake of economic "high growth." In the worst scenario, not addressing this problem could lead to social movements, social violence, and instability that could eventually undermine the whole industrialization process.

24

REFERENCES

Alpha Research. 2012. Thailand Provincial Data 2012–2013, compiled and published by Alpha Research Co., Ltd. Thailand: Nonthaburi. www.alpharesearch.co.th

Buakamsri, T., Larson, D., Harnnarong, F., Saetang, P., and Mooksuwan, W. 2005. *Thailand's Air: Poison Cocktail Exposing Unsustainable Industries and the Case for Community Right to Know and Prevention*. Bangkok: CAIN, Campaign for Alternative Industry Network, Greenpeace Southeast Asia & Global Community Monitor.

Center for Integrated Plan of Operations (CIPO). October, 1982. *Briefing on Thailand's Eastern Seaboard Planning and Implementation to the World Bank*. Bangkok: NESDB..

Center for Integrated Plan of Operations. (CIPO). June, 1992. *Overview, Thailand's Eastern Seaboard Development Program*. Bangkok: NESDB.

Dixon, C. 1999. The Developmental Implications of the Pacific Asian Crises: The Thai Experience. *Third World Quarterly*, Vol. 20, No. 2.

Environmental Health Department. 2002. Minamata Disease: *The History and Measures*. Tokyo: Ministry of Environment.

FENG, Danyang, Takehiro Hashimoto. 2012. Yokkaichi Asthma and Building the System of Certification of Pollutionrelated Patients in the 1960s. *Historia Scientiarum* Vol. 21-3.

Gresser, Julian, Koichiro Fujikura, Akio Morishima. 1981. The Legacy of the Four Major Pollution Trials *Environmental Law in Japan*, 65-132.

Guo, Peng. 2008. Mortality and Life Expectancy of Yokkaichi Asthma Patients, Japan: Late effects of air pollution in 1960s–70s. *Environmental Health* 7:8.

Harada, Masazumi. 2004. *Minamata Disease* (translated from Japanese version published in 1972). Tokyo: Kumamoto Nichinichi Shimbun.

Hironori, Sasada. 2013. Institutional Evolution in Postwar Japan (1946-65). In *The Evolution of the Japanese Developmental State*, 120-164. New York: Routledge.

Huddle, Norie and Michael Reich. 1987. Tragedy at Minamata. In *Island of Dreams: Environmental Crisis in Japan*, 102-132. Cambridge: Schenkman Books, Inc.

International Center for Environmental Technology Transfer (ICETT). 2010. Approaches to Air Pollution Control (Case Study I). Yokkaichi City, Mie Prefecture: ICETT. www.icett.or.jp/english/abatement/mie/index.html

Imamura, Tomoaki, Hiroo Ide, Hideo Yasunaga. 2007. History of Public Health Crises in Japan. *Journal of Public Health* Vol. 28, No. 2 (p 221–237).

Japan Bank for International Cooperation (JBIC). March, 2001. Ex-post Evaluation for ODA Projects 2000 (Summary). Tokyo: JBIC.

Japan External Trade Organization (JETRO). 2007. Invest Japan No. 18. www.jetro.go.jp/en/invest/reports/newsletter/pdf/ij_18.pdf

Japan International Cooperation Agency (JICA). November, 1983. *Final Report, the Study on the Development Project of the Industrial Port on the Eastern Seaboard in the Kingdom of Thailand*. Tokyo: JICA.

Kazuhiro, Ueta. 1995. Environment and Economy: Lessons of Japan's Environmental Problems and Policies. In *Development and the Environment: The Experiences of Japan and Industrializing Asia*, edited by Reeitsu Kojima, Yoshihiro Nomura. Tokyo: Institute of Developing Economies.

Ministry of Environment (MOE). 2013. *Lessons from Minamata Disease and Mercury Management in Japan*. Tokyo: Environmental Health Department.

National Economic and Social Development Board (NESDB). 1981. 5th National Economic and Social Development Plan (1982 – 1986). Bangkok: Office of Prime Minister.

NESDB. 1986. 6th National Economic and Social Development Plan (1987 – 1991). Bankgok: Office of Prime Minister.

NESDB. 1991. 7th National Economic and Social Development Plan (1992 – 1996). Office of Prime Minister: Thailand.

NESDB. 2001. 9th National Economic and Social Development Plan (2002 – 2006). Bangkok: Office of Prime Minister.

Phettakul, S. 2010. Keynote Speech to *"Seminar on Investment Outlook in Thailand" on "Map Ta Phut Issue."* Imperial Hotel, Tokyo. March 12.

Phongpaichit, Pasuk, Chris Baker. 2002. *Thailand: Economic and Politics* (2nd Edition). New York: Oxford University Press.

Phongpaichit, Pasuk, Chris Baker. 1998. *Thailand's Boom and Bust*. Thailand: Silkworm Books.

Pollution Control Department (PCD). 2000. *Thailand State of the Environment: The Decade of 1990s*, Bangkok: Ministry of Natural Resources and Environment.

PCD. 2006. *Thailand State of Pollution Report 2006*. Bangkok: Ministry of Natural Resources and Environment.

PCD. 2010. *Thailand State of Pollution Report 2010*. Bangkok: Ministry of Natural Resources and Environment. .

Takafusa, Nakamura. 1995. *The Postwar Japanese Economy: Its Development and Structure, 1937 – 1994* (2nd Ed). Tokyo: University of Tokyo Press.

Ui, Jan. 1992. *Industrial Pollution in Japan*. Tokyo: United Nations University Press.

Upham, Frank. 1987. Environmental Tragedy and Response. In *Law and Social Change in Postwar Japan*, 28-77. Cambridge: Harvard University Press.

Walker, Brett. 2010. Toxic Archipelago: *A History of Industrial Disease in Japan*. Seattle: University of Washington Press..

Wesley. 2013. Japan–Thailand Trade Directory, Singapore: Wesley Publishing Co. PTE Ltd..

Yoshida, Katsumi, Kunimasa Morio, Kazuhito Yokoyama. 2007. Epidemiology and Environmental Pollution: A Lesson from Yokkaichi Asthma, Japan, 263–278. In *Progress in*

Environmental Research, ed. Irma C. Willis. Hauppauge, New York: Nova Science Publishers Inc.

UNESCO. 2011. *Representation and Decision-Making in Environment Planning with Emphasis on Energy Technologies*. Bangkok: UNESCO.

LIST OF INTERVIEWS

No.	Name of Interviewee	Position	Organization	Date of Interview
1.	Ms. Penchom Saetang	Director	Ecological Alert and Recovery – Thailand (EARTH) and former member of Four-Parties Committee	01/09/2013
2.	Ms. Paranee Sawasdirak	City Plan Expert	Social and City Planning Network.	25/09/2013
3.	Dr Buntoon Sethasirote	Executive Director	Good Governance for Social Development and the Environment Foundation (GSEI) and Former Spokesperson of Four-Parties Committee	27/09/2013
4.	Mr. Noi Jaitang	Community Leader	Member of Eastern People Network	01/10/2013
5.	Mr. Thong Chai	Community Leader	Member of Eastern People Network	01/10/2013
6.	Mr. Sutti Atchasai	Coordinator	Eastern People Network	02/10/2013
7.	Dr. Decharut Sukkumnoed	Director	Healthy Public Policy Foundation (HPPF) and a scholar at Kasetsart University	04/10/2013
8.	Mr. Suphakit Nuntavorakarn	Researcher	Healthy Public Policy Foundation (HPPF) and current member of a sub-committee under Four-Parties Committee	04/10/2013
9.	Dr. Renu Wetratchpimon,	Associate Professor	Silpakorn University	11/01/2013
10.	Mr. Srisuwan Chanya	Lawyer	Stop Global Warmming Association	12/10/2013
11.	Mr. Yoichi Tani	Supporter	Minamata Disease Victim Mutual Aid Society	13/01/2014
12.	Prof. Masanori Hanada	Professor	Kumamoto Gakuen University	15/01/2014
13.	Dr. Takashi Miyakita	Professor	Kumamoto Gakuen University	11,12 & 15/01/2014
14.	Mr. Naoyuki Sakumoto	Director	Administrative Affair, JETRO	21/01/2013
15.	Mr. Kenji Otsuka	Senior Researcher	IDE-JETRO	30/01/2013
16.	Prof. Anne McDonald	Professor	Global Environmental Studies, Sophia University	31/01/2013
17.	Prof. Kito Herofumi	Professor	Yokkaichi University	14/03/2014
18.	Ms. Tanizaki	Staff	Yokkaichi City Environmental Study Center	14/03/2014
19.	Mr. Yukikaza Noda	Patient and Story Teller	Yokkaichi City Environmental Study Center	14/03/2014
20.	Mr. Sawai Kiroku	Supporter	Yokkaichi City Environmental Study Center	14/03/2014
21.	Mr. Katsuji Yamamoto	Worker	Yokkaichi City Environmental Study Center	14/03/2014