INDUSTRIALIZATION AND WATER QUALITY IN RAYONG PROVINCE, THAILAND: Are International, National and Local Water Management Strategies Complementary or Contesting

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Why RAYONG PROVINCE?

1. Site of Thailand’s major Industrial Estates
   ‘Map Ta Phut Industrial Complex - MTPIC’
2. Most of raw water in East of Thailand is distributed for Rayong

The amount of water consumption in Eastern Seaboard during 2014-2034

- Rayong: 303.89 million cubic meters
- Bowin-Pluakdaeng: 302.89 million cubic meters
- Chonburi: 121.09 million cubic meters
- Chachoengsao: 17.18 million cubic meters
3. MTPIC, especially Map Ta Phut Industrial Estate (MTPIE) is the biggest water consumer

<table>
<thead>
<tr>
<th>Sector</th>
<th>1996</th>
<th>2006</th>
<th>2016</th>
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<tr>
<td></td>
<td>m.cu.m.</td>
<td>%</td>
<td>m.cu.m.</td>
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<tr>
<td>Consumption/tourist</td>
<td>26.7</td>
<td>2.75</td>
<td>41.0</td>
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<tr>
<td>Industry</td>
<td>77.7</td>
<td>8.00</td>
<td>149.0</td>
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<tr>
<td>Agriculture</td>
<td>867.0</td>
<td>89.25</td>
<td>867.0</td>
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Water consumption in Rayong Province in 1996 - 2016 (EW)
Research Questions

How is water allocated, who benefits, and who is impacted by the cycle of Thailand’s industrialization?
Research methods

- Desk research  
  August 2018 – February 2019

- Field research  
  September - November 2018
After discovering natural gas in the gulf of Thailand, the Thai government implemented a policy to promote the Eastern Seaboard Development Program (ESDP)

ESDP was constructed in the early 1980s, and started operations in 1990

MTPIE as a part of ESDP is Thailand's largescale heavy-chemical industrial area utilizing natural gas

MTPIE and MTP port with 76 factories are the core industrial estate run by the Industrial Estate Authority of Thailand (IEAT)

Key investor countries for ESDP construction were EU, US, and Japan

Japan by ODA was the major funder for the initial plants' construction and Japanese companies are the major investors in the area

ESDP is in the process of developing to be the Eastern Economic Corridor (EEC)
Transformation of Map Ta Phut Area

Before

After

Construction site of MTP IC in early 1990s (Photo credit: JICA)
History of Water Governance in Rayong Province

➢ **Before industrialization**
  - free and safe to access
  - canals, ponds, streams, wells, and rainfall

➢ **During construction and after operation**
  - In 1982, incorporated increasing the amount of water for MTP and the area’s industrialization plan into the national development plan
  - Developed irrigation, reservoirs, and pipelines along with industrial construction
  - ODA loans supported to increase water resource capacity and design
  - In 1992, East Water was a public company established to manage water resources to secure industrial production
History of East Water

I. In 1992, two years after ESDP began operation, the Thai government demanded to establish EAST WATER as a state enterprise.

II. Provincial Waterworks Authority held 100 present shares in order to increase efficiency in developing and operating water supplies on the east coast to support the area as the main industrial site of the country.

III. In 1993, EAST WATER was contracted by the Irrigation Department to operate water in Eastern Thailand.

IV. The contract between EAST WATER and Irrigation Department began on January 1, 1994 and will be terminated on December 31, 2033.

V. In 1997, EAST WATER was registered to SET and the business has been constantly growing from in capital, from 10 million THB to 1.664 billion THB as of 2012.

VI. In present-day, the shareholders include 40.20% of Provincial Waterworks Authority, Electricity Generating PCL (EGCO Groups) 18.72%, Industrial Estate Authority of Thailand 4.57%, and the other 36.51% are general investors.
Water control and water allocation during the process of industrialization

I. Previous common water became raw water to be managed by East Water

II. Reservoirs and distribution system increased water supply availability, but are built on common water resources

III. Increasing the amount of water and the governance capacity was prioritized to support industrial production

IV. Groundwater is not abundant due to the increase of water consumption
Changing Water Allocation and Pollution During Industrialization

I. Water has changed from mainly a common resource to privatized water.

II. The total amount of water has increased, with more reservoirs and a distribution system. Supply to industrial production is prioritized.

III. The water supply pipelines are mainly installed in the main capital road and linked directly from the water resources to the industrial area.

IV. Not all local people can access water supplies due to the cost of connection with the main pipeline. Even those who can afford to connect with the pipeline sometimes lack water during the summer.

V. Meanwhile, the common pool water has been contaminated due to the process of industrialization. Many locals still use groundwater.
Water and Civil Society Movement

1980s-1990 during the construction
I. Water was not an issue addressed by civil society. Focus was on land relocation and noises

II. The civil society movement challenging the impacts of industrialization wasn't strong
   • Little experience on industrial impact
   • Country governed by unelected Prime Minister General Prem Tinsulanonda

1990s – 2009 after Industrial operation to Air Pollution Control Area
I. A few years after industrial operation, water contamination became an issue

II. In 2005, there was a conflict between the communities and industry over water allocation

III. In 2007, increasingly serious environmental impacts, including water contamination, led communities to call on the Court for the govt to declare MTP a pollution control area.

IV. In 2009, Map Ta Phut and the vicinity area were declared as a pollution control area.
Water Contamination after MTP IC Operation (early 1990s)

I. Concern about water quality occurred together with other pollution issues due to the increasing number of factories.

II. Water contamination made groundwater no longer potable and safe for use.

III. Polluted rain water also affects health and plants.

IV. Canals became contaminated from factories’ wastewater
I. Canals inside the MTP are contaminated by industrial wastewater

II. Groundwater in the residential area nearby the MTP is contaminated

III. Rainfall is contaminated due to air pollution, which is also contaminating soil

IV. Local residents living in downstream areas and using groundwater will soon suffer from pollution if relevant stakeholders fail to stop dispersion.
I. Analysis of water collected during 2005-2006 and other environmental problems report submitted to the Administrative Court in 2007

II. In 2009, Map Ta Phut and vicinity area were declared as a pollution control area, and water contamination was one of the problems that needed to be solved.
Water Distribution Conflict in 2005

Cause

I. Rainfall shortage and high water demand

II. There was no rainfall from October 2004 to the end of August 2005

III. Industrial users were the major EW water consumers

Immediate Solution

I. Limited time to distribute water to communities

II. Increase the amount of water
   - installed water-pipe and pumping station to pump water form Rayong river to EW system
   - installed water-pipe and pumping station to pump water from communities’ canals to MTPIE.
Community Movement towards 2005 drought

I. Direct action to stop IEAT and EW to install water-pipe and pump succeeded with Khlong Tab Ma

II. Organizing public demonstration and seminar on water issue

III. Submitting complaint letter to local and national administrations

IV. Establishment of Eastern People’s Network, Rayong province

V. Water injustice become an issue of common discussion
Overall Environmental Policy and Practice after the Contestation Between Communities and Industrial Sector

Government Action

• adopting the implementation of the 2007-2011 Pollution Reduction in Rayong Province Action Plan which was focused on the Map Ta Phut area.

• adopting the idea from European countries and Japan to develop Map Ta Phut Industrial Area into an “Eco-Industrial Park” or Eco-Industrial

• Awarding companies that have good practices in environment

• Monitoring pollution and releasing annual reports

Business Action

• Attempting to decrease major air pollution problems from their factories’ operations

• Adopting international tools on sustainable development into companies’ policy

• Launching CSR programs

• Initiating Tripartite on factory inspection
Overall Environmental Policy and Practice after the Contestation Between Communities and Industrial Sector

I. SCG established ‘Water Management Committee’ in 2014

II. WMA; defining a clear direction and strategy for water resources management
   - Reducing water consumption by improvement of manufacturing processes and developing products
   - Increasing cycle of water usage

III. SCG goal is to reduce the water withdrawal per production unit by 20% by 2020 compared to 2014.
Applying 3Ws combine with 2Ws

I. Using 3Ws for internal plan; recycling effluent from wastewater treatment system, and increasing cycle numbers of water

II. Using 2Ws for external plan; cooperation with community, NGO, Government, and Water War Room
Overall Situation after the Contestation Between Communities and Industrial Sector

‘Industries survive, communities survive, environment survives’ has been released’ (Chatree, 2018)

‘Industry is a part of Communities and living together with happiness and sustainability’ (IEAT, 2012)

“Community and Industries can live together, in other words, communities have to have more tolerance because we have nowhere to move and the factory is not going to stop its operations” (Pat-Ban Plong community committee, interview 16 Sep 2018)
Water Situation on the Ground

Water distribution, water contamination, and water quality remain an issue for local communities.
From the Pollution Control Department’s annual report during 2008 – 2012, groundwater in the pollution control area is contaminated and cannot be used until the area is restored.
รูปที่ 7 ตัวอย่างลักษณะทางกายภาพ ของบ่อน้ำเต็มน้ำที่ทำการตรวจสอบในพื้นที่เขตควบคุมมลพิษ

รูปที่ 8 ตัวอย่างการแจ้งเตือนบ่อน้ำเต็มและบ่อบ้าตั้งบ่อการติดตั้งเกอร์
Implications for local communities

I. Water-pipe and pumping station at Khlong Nam Hu still working 24 hours

II. Suffering from water contamination and no access to water supply

III. Spending personal budget to connect with water supply-pipe, do not collect enough water

IV. Spending personal budget to connect with main water-pipe, but suffering from poor water quality
Implications of the EEC Plan


II. Society addressed concerns about increasingly serious and complex environmental impacts, as existing pollution has not been fully addressed

III. Water distribution increasingly complex due to climate change, higher demand above existing current water capacity (with potential implications, such as water transfer from Cambodia)

IV. The impact on sourcing new raw water and water governance is an emerging issue
Increasing Existing Reservoir capacity & Seeking More Raw Water

5 Year Plan
Increasing demand for water from **427 to 780** million cubic meter

1. Increasing storing capacity and managing from existing reservoirs

2. Developing 4 new reservoirs

3. Linking water resources to increase water efficiency management
10 Year Plan

Increasing amount of water from 700+ to 1,000+ million cubic meters

‘Building and diverting water from Steung Meteuk Hydropower Dam (SMH)’

I. 2016 Thai and Cambodian govts

II. 2017 Cambodian govt set SMH team to do the Feasibility Study

III. 2017 Thai govt set EGAT to hold 50 percent of shares together with Cambodian side
Summary and Argument

1. Water allocation
   - Amount of water has increased during industrialization
     - 1992 developing and operating water supply to industrial sector
     - 2005 increasing amount of water to secure industrial production
     - 2018 to EEC (2028) increasing amount of water to support industrial explanation toward EEC

2. Water demand determined by industrial and elsewhere
   - The locals earn least
   - The affected group is not only local people in MTP, but also people in Eastern Thailand
   - Cambodian people are going to be the next

3. Impacts of industrialization also make water unusable, ground and rain.

4. Using the court in 2009 to hold state agencies and factories owners to account for the environmental and social harm caused
   - The problems have still not been solved - all issues over water pollution or water access from the perspective of some locals.
New Research Questions

I. How is water allocated, who benefits, and who is impacted by the cycle of industrialization in Japan and Thailand?

II. Why do we have to include other actors in large scale or even in regional contexts when talking about the local situation and local impacts from development projects in a particular country? - Have to clarify local impact of Map Tha Pud on a large scale

III. Discourse of water efficiency – ‘reducing water consumption in manufacturing processes and increasing cycle of water usage’ – will this result in a solution to the ground problem, raw water supply, and polluted water, or result in industrial expansion?
Thank you for your attention