

Chapter 4

Municipal Solid Waste Management in Thai Local Governments: The State of the problem and prospects for regional waste management

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Abstract

In Thailand, Prayut interim government announced a roadmap in August 2014 for solving the Municipal Solid Waste (MSW) problems of the country, revising the laws and regulations concerning the problem. At the end of 2018, the central government had new plans and a policy framework in place to solve the MSW problem by using the framework of regional waste management, which gives the leading role to the provincial governor and provincial administrative organization (PAO) of the local governments. However, to realize the roadmap targets at the local administration organizations (LAOs) level to raise a rate for treatment, there is a strong need to use cost-effective technologies like composting as well as the proper financing of incinerators at the local government level. Challenges exist to make this plan possible, such as a lack of technical and financial supports for the local governments and inadequate staff for operation. These are the next problems to be tackled by the Thai government after the general election at the end of March 2019.

Keywords: Regional waste management, Thailand, Local government, Roadmap for municipal waste management, Waste to energy policy

Introduction

After the military coup'état 2014 in Thailand, the Prayut interim government announced to fight with the problem of accumulated municipal solid waste (MSW) all over the country. At that time, it was reported that the cities and local governments in Thailand were facing the crisis of a garbage handling. At the same time, the United Nations Economic and Social Commission for Asia and Pacific (ESCAP) warned of severe environmental problems and long-term health issues caused by contaminated

water and land in open dumping sites in Thailandⁱⁱ. The Prayut government introduced a series of new waste management policies after the Cabinet's approval of the National Master Plan for Waste_Management_2016-2021 in May 2016. According to the Master Plan, open dumping sites and improper treatments should be replaced by sanitary landfills and incineration, and many existing open dumping sites are to be rehabilitated. In line with this, Pollution Control Department (PCD) under the Ministry of Natural Resources and Environment (MONRE) also showed the guidelines to LAOs on December 16, 2018 to tackle with 77,000 tons of untreated MSW within the year 2019. Consequent to the new policy, this study focuses on a new role of Thai local governments in MSW management in the National Master Plan, and summarizes the remaining problems of regionalized waste management in Thailand.

This paper will first look at the Thai local governance system in section 1. In this section, changes in local government policy during the military government will also be referred to. Section2 explains the present state of MSW problems and related laws and regulations. It also reviews the Thai Local Administration Organization's(LAO's) views regarding MSW management from the 2013 survey data. Then in Section3, the new policies on local networking, including regional cooperation among LAOs are explained. Section 4 describes the remaining problems and prospects for the new roles of local governments.

1. Thai local governance system

1-1 New LAOs and their new duties

In Thailand, a fully-fledged decentralization process began during the 1990s, and four types of new LAOs classified as(1)~(4) below, were created. Before the 1990s, the basic LAO units were the city units (*Thesaban* in Thai) in core urban areas that had been set up since 1935, the sanitary districts (*Sukhaphiban* in Thai) in semi-urban areas, and the provincial administrative organizations (PAOs) that covered provincial areas, including rural areasⁱⁱⁱ.

During the 1990s decentralization, the *Thesaban* in core metro cities were given the status of (1) "*Thesaban Nakhon*." *Thesaban* in the central districts were changed into (2) "*Thesaban Muang*", while many sanitary districts (*Sukhaphiban*) were renamed as (3) "*Thesaban Tambon*."

In Thai rural areas, local self-government bodies were set up only after the promulgation of the *Tambon Council and Tambon Administrative Organization Act* of 1994 (third version in 1999). The new rural LAOs were called (4)*Tambon*

Administrative Organizations (TAOs; *Ongkan Borihan Suan Tambon* in Thai), and many small-scale rural local governments began working to service rural residents.

For (1)“*Thesaban Nakhon*” and (2)“*Thesaban Muang*,” MSW collection and management had been a duty since the era of *Thesabans* and *Sukhaphibans*. The 1953 Thesaban Act Matra 50(3) and in Matra 53(1) prescribed the duty of *Thesaban* to keep clean the road, roadside and public space and to treat waste. In some famous metro cities like Phuket and Hadjai (cited as “Leading Municipality Models” in Kojima’s introduction) with their stable financial backgrounds, efficient methods of MSW management, such as incineration, had already been introduced. And the duties of Provincial Administrative Organizations are prescribed in 1999 Provincial Administrative Organization Act.

However, for the new and rural TAOs and *Thesaban Tambons*, collecting community waste and hazardous waste was a new task prescribed in 1994 *Tambon Council and Tambon Administrative Organization Act*, in Matra 67(2). (the duty itself is included in the 1992 Public Health Act). Once again, the duties are clearly stated in “the 1999 Decentralization Act” and “the 2001 Decentralization Action Plan” in Thailand.

Nonetheless, there have been no clear standards for rural TAOs to regulate waste disposal properly until recently. Many TAOs practiced open dumping and landfills without the proper processing of collected waste. In many places, the informal sector serviced recycling or transferring process in the dumping sites. At the end of the waste management stream, open burning was practiced. However, as the amount of MSW increased every year, the previously mentioned waste management measures began to cause problems in the communities such as odors, sanitary problems and polluted ground water. At the same time, serious problems related to NIMBY (not in my backyard) groups, who were against siting new waste disposal facilities locally began to arise everywhere in Thailand^{iv}.

The Prayut interim government, who recognized a state of an emergency in waste handling, decided to tackle it by allocating a large portion of the national budget to the problem. It created the road map in May 2016 for more proper waste management policy throughout the country. One important outcome was the “Cleanliness and Orderliness of the Country Act” amendment on January 16, 2017, that clearly outlined the authority of LAOs (instead of districts) in the field of waste collection and management under supervision of the provinces and the Ministry of Interior(MOI). The government also embarked on a large-scale campaign called “Clean Province Action Plan” to support enforcement of the new law.

1-2 The dual system of local governance

It is a well-known fact that the Thai local governance system is quite complicated and unique. To discuss decentralization in Thailand, it is essential to understand the state administrative structure, including the difference between local administration and local self-government. A key point here is that Thailand adopted a dual system of local administration and local self-government.

According to the 1991 State Administration Act, the Thai state administrative structure consists of two systems: Central-Local administration and local self-government (see Figure 4-1). The central administration system consists of ministries and departments, while the local administration system is comprised of provinces and districts. Central ministries, notably the Ministry of Interior (MOI), the Ministry of Agriculture and Cooperatives, the Ministry of Education, and the Ministry of Public Health, have their own branch offices at the provincial and district levels. The ministries dispatch their central officials to these field offices directly.

What is unique to Thailand is that these local administration units are individual entities; provinces even have the status of a juristic entity. Provincial governors and district officers, who are MOI officials, have the statutory authority to direct and order government officials from other central ministries and departments at the provincial and district levels. However, administrative sectionalism is evident even at those levels: the vertical relationship between ministries and departments outweighs the horizontal coordination within the provincial office.

The local self-government system is distinct from the central and local administration. It is made up of 7,780 basic LAOs nationwide (as of March 1, 2006, there were 1,156 *Thesaban* and 6,624 TAOs). The local self-government is under the supervision of the provincial governors and district officers of the MOI, who have the authority to approve the LAO's annual budget plans and local regulations, dissolve local councils, and dismiss local councilors.

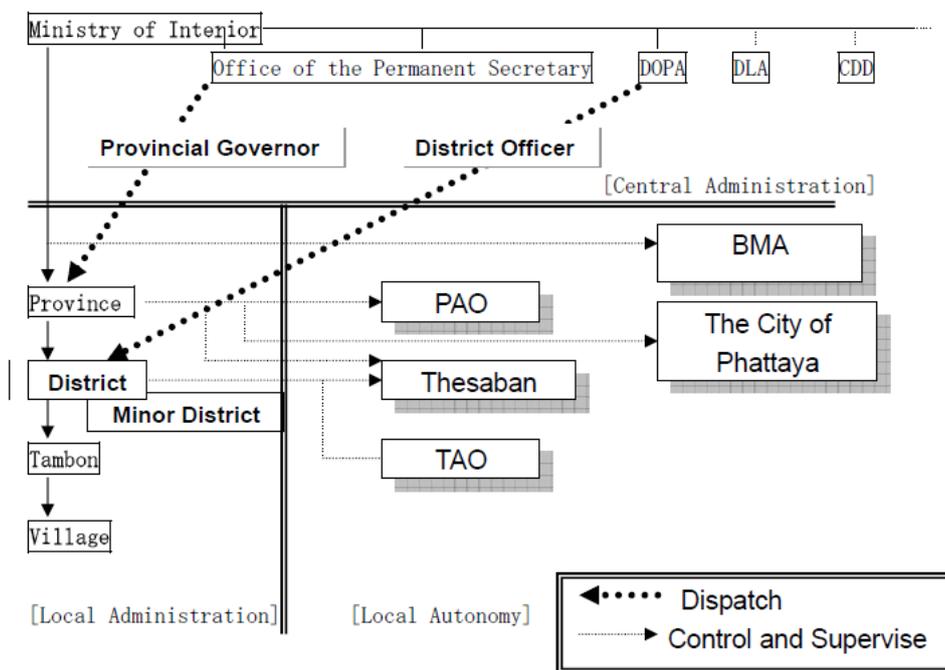
To summarize, there are two main characteristics of the local governance system in Thailand: the first is the dual system (co-existence) of the LAO (self-government) and local administration (central-local administration) branches. The former consists of local organizations headed by representatives elected by local residents. The latter is primarily administered by provincial governors and district officers, appointed directly by the MOI. Under the district level, there are *Kamnans* (*Tambon* district head in Thai) and village headmen (Figure 4-1).

The second characteristic is the profound control of the self-government by the central government. The MOI and the provincial governor have the authority to dismiss the LAO head and local councilor, who are elected by popular vote, to dissolve the local councils, and to approve the budgets of the LAOs. The district officer reports on the LAO budget and activities to the provincial governor, who reports to the MOI. In fact, the Minister of the Interior, provincial governors, and district officers have retained the power of control and supervision of LAOs up to the present.

In fact, this dual system has had a large effect on the recent MSW policy management. In the MOI's MSW policy model, the steering committees for MSW management, chaired by the provincial governors, were created in all provinces, and the committee members include district officers, *Kamnans* and village headmen as well as the LAOs, which means that both local administration and local self-government must work together under the guidance of the Province. The LAOs must present their plans and contracts with the private sector to the committee to be supervised and admitted by the province. The LAOs' new MSW management plans are all reported to the MOI through this steering committee system. Some academics are critical towards this MOI model, in the sense that it deprives LAOs of their autonomy and their decision-making process, in return for a budget that is distributed through the MOI.

Figure 4-1 Diagram of Control of Local Authorities (since October 2002)

Fig. 1 Diagram of Control of Local Authorities by Interior Ministry (since October 2002)



Note: In the ministerial reorganization in October 2002, the Department of Local Administration (DOLA) was divided into three entities: the Department of Provincial Administration (DOPA), the Department of Local Administration, and the Department of Disaster Prevention and Mitigation (DDPM). DOPA retained the authority to control and supervise provincial governors and district officers.

Source: Compiled by the author (Nagai)

1-3 Local government policy under the NCPO interim government

The decentralization policy in Thailand underwent a massive change during the military government from 2014 to 2019 March. Just after the May 22 coup in 2014, the NCPO (the National Council of peace and Order) who had staged the coup ordered that LAO presidents and council members that had completed their terms be replaced by the appointees by the Ministry of Interior (in many cases the chief clerk of LAO or the former presidents). The LAO leaders were later ordered not to travel abroad with official budget. NCPO stated that the aim of this order was “to streamline LAOs, many of which are suspicious for corruption and irregularities of budget use.” In fact, NCPO began to sue thousands of corruption cases at LAO levels to the National Counter Corruption Commission. In this way, the Bangkok elite who staged the coup held strong antagonism toward rural LAOs and showed distrust toward them. Consequently, in the first half of the NCPO era, the NCPO transferred the 30 billion baht of the LAOs’

budget in 2015 to the budget supervised by central government^v. However, after introducing the Master Plan 2016-2021, the NCPO reversed its local policy and reinforced the roles of LAO by amendment of “Cleanliness and Orderliness of the Country Act” in 2017. (which regulates the LAO roles in waste management). The budget to LAOs concerning the waste management was increased from 567 million baht in 2013 to 3196.58 million baht in 2016. At the same time, the LAOs plans and budget negotiations with this issue will be under control of the MOI, via the steering committee at the provincial levels,. which will be explained in the following section.

2. Waste management problems and the new laws on MSW at the local level

Next, the paper will outline the state of MSW problems in Thailand and will explain how the LAOs coped with the problem.

2-1 Classification of wastes in Thailand and its present status

In Thailand, waste is classified into five categories: (1)Municipal Solid Waste, (2)Infectious Waste, (3)Industrial Hazardous Waste, (4)Industrial Non-Hazardous Waste, and (5)Community Hazardous Waste. The basic laws related to (1) are: the Enhancement and Conservation of National Environmental Quality Act B.E.2535, the Public Health Act B.E. 2535, and the Cleanliness and Orderliness of the Country Act in 2017.

Different ministries take responsibility for each category. The Ministry of Natural Resources and Environment (MONRE), especially the Pollution Control Department (PCD) takes care of (1) and (5). The Ministry of Public Health collects category (2) from hospitals and health care centers, while the Ministry of Industry (Department of Industrial Work) and The Industrial Estate Authority of Thailand (IEAT) take care of (3)and (4).

Thailand generates a large amount of municipal waste, at 26,850,000 tons per year. MSW generation per capita per day in Thailand is 1.05 kg as of 2016, which comes in fourth place among ASEAN countries after Singapore, Brunei and Malaysia. The amount of annual MSW generated is increasing every year .

Out of 26,850,000 total tons of MSW in Thailand, 76.23% is collected in collection areas(20,470,000 tons), 17.65% is recycled, and 31.06% is properly treated, while 26.63% is improperly treated(8,340,000 tons). Of the 31.06% of MSW properly

treated, 25.66% goes to landfills, 1.52% is incinerated, while only 1.82% is composted. The composition of MSW is mostly (1) Food/Organic waste 64%, (2) Paper 8%, (3) Plastic 17.6% and (4) Metal 2% (UNEP[2017:13]).

Since the proportion of food and organic waste is quite high (64%), the Thai government has set the following targets: first, to reduce the amount of food and organic waste at home; second, to increase the amount of composting and refuse-derived fuel (RDF) production from food and organic waste; and third, to increase incineration to reduce the total quantity of sanitary landfills. In fact, utilization of the organic component of municipal waste as a valuable resource is a key point to efficient waste management. Full-scale utilization of the organic component of MSW, including food and organic waste, as a valuable resource is needed in Thailand

2-2. How LAOs cope with waste management

This section will present the results of the LAO survey conducted in 2013^{vi}. From the survey results, we can observe that in 2013, most LAOs were already aware that complaints from residents about garbage were a severe problem. From Table 4-1, of the environmental issues in the community, complaints from residents about garbage were the most frequent, followed by complaints about odors, waste-water, and air pollution.

Table 4-1. The Complaints from residents concerning environmental problems that LAO presidents receive every day.

	Frequency	Ratio
1) Odors, wastewater, air pollution <u>from residents</u>	166	35.9
2) Odors, wastewater, air pollution <u>from factories</u>	125	27.1
3) Odors, wastewater, air pollution <u>from farms</u>	148	32.0
4) Garbage <u>from residents</u>	197	42.6
5) Waste <u>from factories or organizations</u>	42	9.1
6) Waste <u>from farms</u>	23	5.0
7) Others	54	11.7

Source: From the Local Governance Survey 2013.

On the other hand, 43% of LAOs were optimistic about their capabilities to solve environmental problems. According to Table4-2, 17.7% of LAO Presidents answered that “there was no problem,” and 43% thought they could solve the problem by themselves. At that point, there were no clear waste management standards or regulations from the central government, and thus in 2013, LAOs seemed to solve waste problems in their own ways.

Table4-2 Capability of LAOs concerning the environmental problems solution
Question: “Were you able to solve the following problems?”

Problems	The LAO could solve the problem(s) by itself.	The LAO could solve the problem(s) by contacting the other agencies in charge.	The LAO was unable to solve the problem by itself.	No such problems have arisen.	No Answer
Odors, wastewater, air pollution <u>from residents</u>	141 30.5	76 16.5	7 1.5	97 21.0	141 30.5
Odors, wastewater, air pollution <u>from factories</u>	36 7.8	114 24.7	14 3.0	118 25.5	180 39.0
Odors, wastewater, air pollution <u>from farms</u>	84 18.2	100 21.6	9 1.9	108 23.4	161 34.8
Garbage <u>from residents</u>	201 43.5	30 6.5	4 0.9	82 17.7	145 31.4
Waste <u>from</u>	30	60	6	145	221

<u>factories or organizations</u>	6.5	13.0	1.3	31.4	47.8
<u>Waste from farms</u>	30	47	2	157	226
	6.5	10.2	0.4	34.0	48.9

Source: From the Local Governance Survey 2013.

Furthermore, when LAOs contacted related agencies to solve environmental problems, the outcomes reflected the characteristics of the Thai dual system of local governance. Around 37% of Thai LAOs relied on *Kamnans*(sub-district heads) and village headmen from the local administration branch in their attempts to solve garbage problems. This means that the LAOs' work on environmental issues was often supplemented by the help and consultation of the local administration.

Table4-3. The institutions to contact for the LAOs to solve environmental problems.

Question: To solve the following environmental problems, which office or personnel did you contact? (Upper: Frequency, Lower: Ratio)

Problems	Institution/ Person						
	Provinc ial Govern / District Chief Officer	Depart ment of Industr ial works	Polluti on Control Depart ment	Kamna n(Sub District Head)/ Village headm an	Senior membe r of your commu nity	MPs in your constit uency	Intellec tuals/R esearch Institut e/ Univer sity
Odors, wastewater, air pollution <u>from</u> <u>residents</u>	48 10.4	30 6.5	36 7.8	177 38.3	49 10.6	15 3.2	11 2.4
Odors, wastewater, air pollution <u>from</u> <u>factories</u>	61 13.2	92 19.9	61 13.2	83 18.0	37 8.0	15 3.2	12 2.6

Odors,wastewater airpollution <u>from</u> <u>farms</u>	60 13.0	31 6.7	44 9.5	133 28.8	39 8.4	13 2.8	10 2.2
Garbage <u>from</u> <u>residents</u>	28 6.1	10 2.2	15 3.2	173 37.4	66 14.3	11 2.4	9 1.9
Waste <u>from</u> <u>factories/organizat</u> <u>ions</u>	32 6.9	46 10.0	37 8.0	59 12.8	20 4.3	6 1.3	9 1.9
Waste from farms	31 6.7	21 4.5	25 5.4	67 14.5	18 3.9	9 1.9	6 1.3
What other offices did you contact? (Please specify)	59 12.8						

Source: Calculated from the Thai Local Governance Survey 2013.

It is also noteworthy that 15.8 % of the LAOs feel that budgetary support in the field of environment is not enough and budgetary from the central government is needed (Table 4-4).

Table 4-4 The field of policy in need of budgetary support

If the budget amount allocated is not sufficient, which of the following need more budgetary support? (Please choose only two items)

	Frequency	Ratio
1) Promotion of vocational employment	137	29.7
2) Infrastructure development	281	60.8
3) Agriculture	72	15.6
4) Environment	73	15.8
5) Social welfare	83	18.0
6) Education	128	27.7
7) Community-related matters	4	0.9
8) Other	5	1.1

Source: Calculated from the Thai Local Governance Survey 2013.

To summarize the answers from 2013 survey data, Thai LAOs already recognized the waste problems arising in their service unit, but most Presidents felt at that time that they could manage the issue by obtaining help from local administration and related agencies.

3. New laws and regulations: In search of regionalized MSW management

In the process of creating a framework for MSW management (see Table 4-5), new projects are now evolving to pursue the policy targets. PCD set the target in the short-term and long-term (see Table 4-6) and the Thai government

There are five main policy issues and 2 types of management system (clustering of LAO and the provincial steering committee system) are newly introduced.

As mentioned above, the Thai government has set new targets to raise the percentage of proper treatment of MSW. The main points of the new policy are announced as followings:

- (1) To proceed with treatment of improperly treated waste in the past left in LAOs, possible within 2-3 years from 2016.
- (2) To construct treatment facilities such as incinerators with electricity generation and RDF factories, and sanitary landfill sites. Utilization of the organic component of municipal waste (like food waste) to produce RDF and compost will be promoted. To make this possible, LAOs will belong to a cluster and private investment will be promoted.
- (3) To set clear regulatory framework and national standards for proper treatment of general waste and community hazardous waste to be shared among LAOs, private firms and related government agencies.
- (4) To provide environmental education to people after settling new national rules for MSW treatment. Let people know the rules within 6 months and let them follow. Especially, Ministry of Education, LAOs, Ministry of Natural Resources and Environment(MONRE) will cooperate together to let people segregate waste at source. To lessen the volume of waste, related agencies will promote segregation, recycling and composting of waste. Manual Segregation by private collectors, especially by the informal sector at dumpsites, which have been practiced for a long time, should be regulated and formalized in the waste management stream.

(5) Specific space for hazardous community waste must be fixed besides collection space for general waste.

For the first target, PCD announced that 6 provinces (Nakhonpathom, Pathumthani, Saraburi, Ayuthaya, Samut Prakan) with critical situations should be provinces to tackle the problem first to handle left over wastewithin 6 months to 12 months (Table4-5).

As for the second target, the size of incinerators are classified into three (Small/Medium/Large) and 5 incinerator construction projects in 5 provinces are promoted in the first year of road map. Then, incineration facility in other 20 provinces will be prepared in the second year. For the rest part of Thailand, new waste treatment plans, which fit with each LAO’s situations, will be introduced in a long-term.

Table 4-5. The targets of MSW policy planned by PCD in 2015

Short-term targets	<ul style="list-style-type: none"> ·To retreat 80% of mis-managed MSW in the landfill sites within the year 2016 by introducing private funds, constructing RDF and waste to energy factories. ·To create a new system of managing more than 50% of “wet waste” properly in Thailand. ·To separate more than 10% of hazardous waste from general MSW and to treat it properly.
Long-term targets	<ul style="list-style-type: none"> ·To create a new system of managing more than 60% of organic waste and “wet waste” properly in Thailand. ·To separate more than 30% of hazardous waste from general MSW and to treat it properly. ·At the level of LAOs, every kind of MSW is separated at the source. For 50% of district levels (outside of LAO collection areas), introduce a sorting system of MSW at the source. . To stop open dumping.

The road map clearly states that for new MSW management, incineration would be a main choice for waste handling rather than sanitary landfill. To make this plan possible, it is needed to collect moderate amount of waste effectively and thus, the Thai government introduced the framework of LAO grouping under cluster system. Except for some large metro city LAOs (such as *Thesaban Nakhon*), a large sized incinerator

construction will be planned at Provincial level and other basic LAOs (*Thesaban* and TAO) should cooperate in segregation of waste and transferring, which is needed for effective and sustainable incineration. This means that regionalized MSW management is going to be fixed throughout the country.

According to the paper by NESDB, grouping and the clusters (Small/Medium/Large) are planned according to the amount of waste in 2015. The definition is changing, the framework of cluster is not fixed yet.

<3 Clusters (SML) with 324 Groups (from NESDB)>

Large Cluster(more than 301 tons): 44 groups in 27 Provinces covering 1347 LAOs.

Medium Cluster (50-300 tons): 60 groups in 50 provinces covering 3092 LAOs

Small Cluster (less than 50 tons) : 47 groups in 43 provinces covering 2165 LAOs

In line with this policy, the MOI ordered each LAO to make a plan for MSW management and present it to be admitted in the provincial steering committee chaired by Provincial Governor. This steering committee system is composed of Provincial Governor as chairman, LAOs, District heads, *Kamnan* and village headmen as previously stated.

Under this controlling measure by MOI, a new regulation of the MOI on the Public Private Partnership (PPP), specifically for waste management, was promulgated in 2011. In this regulation, LAO can make a contract with private firms who invest for landfill sites and other waste treatment facilities, if admission from Provincial Governor and MOI are obtained^{vii}. The Thai central government announces that it will provide more than half of financial support to Local Administration Organizations for siting waste disposal facilities, as well as subsidizing incinerators. Although possibilities for Public Private Partnership (PPP) are sought for, it is questioned that whether the government can really share the burden of financing in the long-run.

As there is a lack of technical and financial supports from the central government to LAOs who seek private investment, long-term sustainability of this policy is questioned by some government agencies, such as NESDB. Possible changes to financial and technical policy are also expected, which would be an important factor in making the new regional waste management policy more effective.

Table 4-6. The MSW policy formation process since 2014

August 22, 2014	The National Council for Peace and Order (NCPO) announced a roadmap for waste management as a national agenda. Four activities (to dispose of accumulated waste; to construct a new mode of waste treatment, including a waste to energy policy; to provide national standards for MSW and hazardous waste management; and to build up discipline in the nation).
June 16, 2015	The MOI made a proposal to the Cabinet to adapt the 3-cluster system in the roadmap to include local government.
October 13, 2015	The MOI proposed to budget money to local governments for siting RDF factories at the local level.
December 4, 2015	The Office of Prime Minister announced the “Pracharat” system as one method of private-public partnership in the NCPO era.
May 24, 2016	Prime Minister Prayuth chose the Ministry of Science, Technology and Environment and MOI to be the responsible Ministries, and suggested (1) A private sector role with the public sector (as a part of the Pracharat policies) and (2) collection of waste treatment fees.
June 30, 2016	Garbage Box (Pracharat) provided by the government.
July 7, 2016	The Department of Local Administration (DLA) sent letters to provincial governors to make signs for a Memorandum of Understanding (MoU) within 7 days.
July 11, 2016	The DLA promotes “Clean Province 3Rs–Pracharat” campaign.
September 14, 2016	News on Sukhothai Province; a project by MoU for waste treatment was released.
September 20, 2016	MONRE sent an action plan for “Thailand without Garbage” for the year 2016-2017 to the Cabinet
December 6, 2016	The Electricity Generating Authority of Thailand committed to buy 80 megawatts of electricity generated from waste power plants

January 15, 2017	The second version of the National Act for Cleanliness was announced in the Official Gazette
May 30, 2017	The Prime Minister ordered the MOI to finish the plan for waste treatment within one month
October 9, 2017	Prime Minister awarded prizes for “Clean Provinces”
November 22, 2017	The DLA delegated policy for waste management to LAOs by setting up 324 groups, according to their amounts of garbage (Small/Medium/Large)
January 20-21, 2018	DLA opened the Conference for Cluster policy
June 28, 2018	Training programs were held for LAOs to set up clusters in their area groups.
July 10, 2018	The Prime Minister ordered the creation of 324 groups and set up waste treatment centers.
August 15, 2018	The DLA let all the Provinces send back progress reports for their waste projects within 10 days.
August 19, 2018	The DLA answered questions from LAOs on organizations for waste management, EIA for waste treatment plants, and waste power generation and corruption matters.
August 22, 2018	Prayuth secured a 2.7 billion Baht budget for the MOI’s pilot cases of waste treatment.
August 22, 2018	The MOI budgeted 944 million Baht for 8 provinces, but Nonthaburi used 699 million Baht in only one province.
September 11, 2018	The Prime Minister announced a plan to secure 10 billion Baht for the waste management budget, which would account for about 60% of Thai GDP.

Source: Compiled from newspapers by the author

Conclusion

In Thailand, the local governments have just started to engage in the environmentally sound management of MSW under regionalized waste management model. At the end of 2018, the central government had new plans and a policy framework in place to solve the MSW problem by using the framework of regional waste management. The central government has introduced regional cooperation and Private Public Partnership to save

costs to secure economies of scale to promote incinerator with electricity plants and sanitary landfills with proper treatment.

However, challenges exist to make this plan possible, especially for rural local governments, such as a lack of technical and financial supports for the local governments and inadequate knowledgeable staff for operation. These are the next problems to be tackled by the Thai government after the general election at the end of March 2019.

< Related Laws, regulations, National Plans, Strategies and Master plans >

Ministry of Interior 2560 “Prakad krasuan Mahatthai ruang kanjatkan munfoi”

Budget Bureau 2561 “Phrarachabanyat Withikan Ngoppraman 2561”

Thailand, Enhancement and Conservation of National Environmental Quality Act

B.E. 2535, A.D. 1992.

Ministry of Industry 2012 National Industrial Development Master Plan (2012-2031)

Ministry of Industry 2008 National Master Plan on Cleaner Production (2008- 2016)

MONRE 2012 Environmental Quality Management Plan (2012- 2016)

Office of Prime Minister 2017 Twenty Years Country Strategies (2017-2036)

NESDB 2012 11th National Social and Economic Development Plan (2012-2016)

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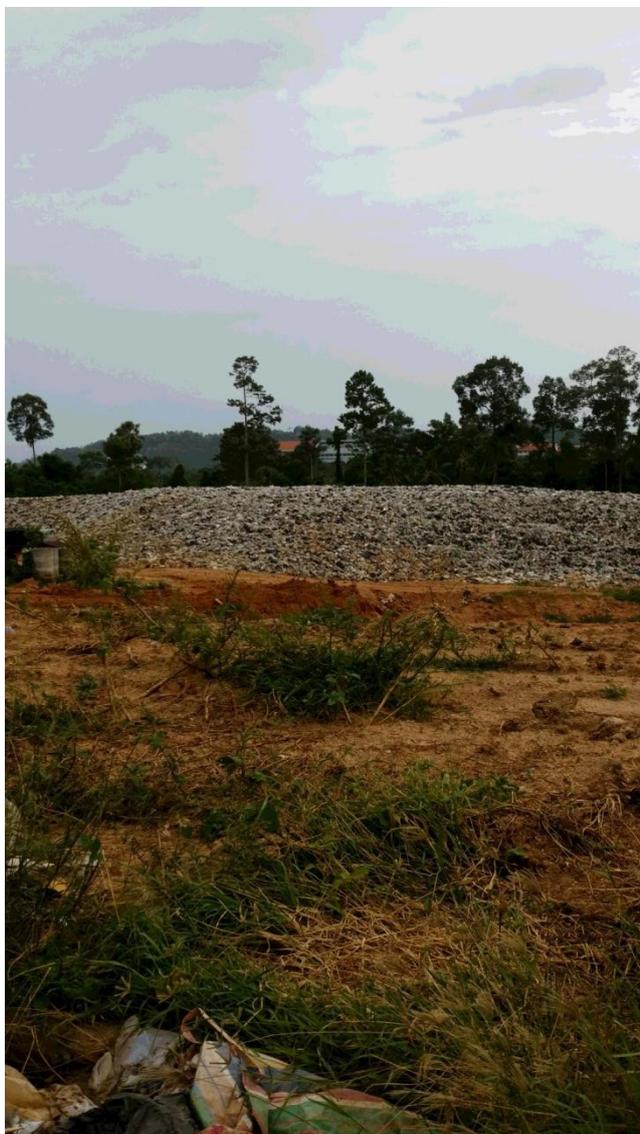
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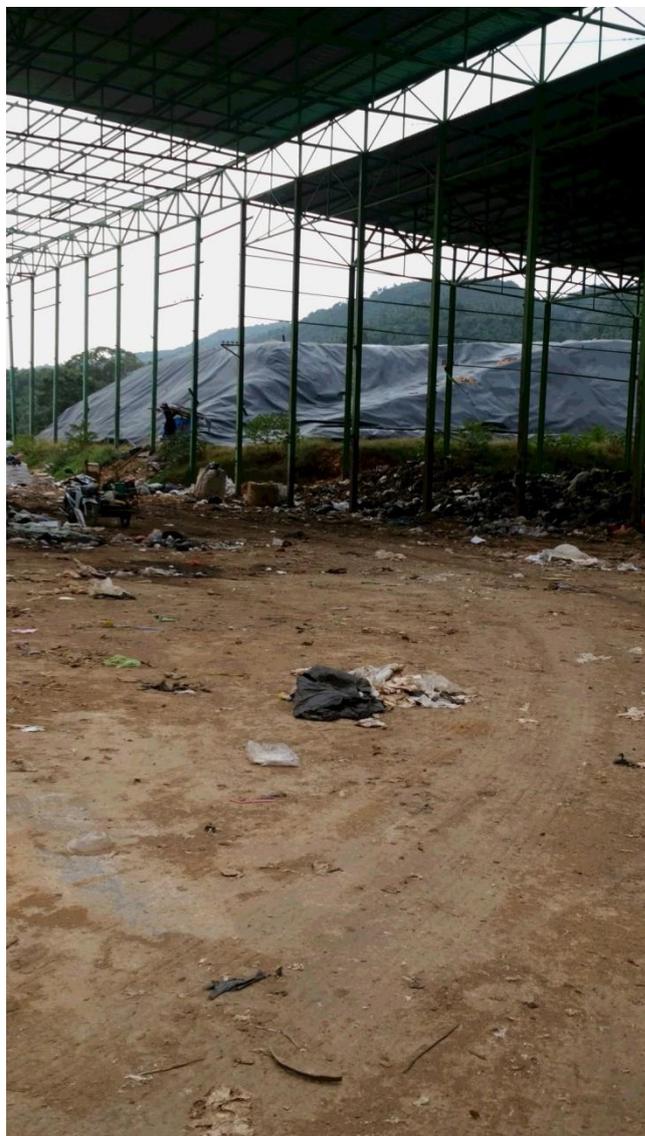
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Figure 4-2. A Dumping Site in the south of Thailand: waste is left in open dumping situation for more than a year to be transferred to the Provincial incineration facility.



(source) photo taken on August6, 2018 by Funatsu

Figure 4-3. A Dumping site of MSW in the south of Thailand: Waste is covered with plastic sheets to prevent odors and damage by insects.



(Source) Photo was taken on August 6, 2018 by Funatsu

Figure 4-4 :The MOI instructs a correct way to segregate waste by this instruction kit



(source) Photo was taken on December 20, 2018 by Funatsu

Figure 4-5 : Instructions for composting by the MOI



(source) Photo was taken on December 20, 2018 by Funatsu

i Senior Research Fellow, Institute of Developing Economies, JETRO.

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- ii Bangkok Post, September 1, 2014. "Thailand totters towards waste crisis."
 - iii A fourth type was the Bangkok Metropolitan Administration (BMA) that contained Bangkok, the capital city and the most urbanized area in Thailand. A fifth type was the City of Pattaya, internationally known as a tourist destination. Sanitary districts and Provincial Administrative Organizations (PAOs) were established during the 1950s, while the BMA and the City of Pattaya were instituted during the 1970s.
 - iv For instance, the demonstrators at Nakhon sawan province blocked the road to show their discontent against construction of the incinerator with electricity generation and 7 of them were arrested by police on December 12, 2018.
 - v Bangkok Post, September 3, 2014, "Budget cuts irk local administrations."
 - vi 永井史男、籠谷和弘、船津鶴代[2017]「〈資料〉タイ地方自治体エリートサーヴェイ調査」『法学雑誌』（大阪市立大学法学会）第63巻第4号、78-104頁。
 - vii Although Thailand already had the 2013 Public Private Partnership Act, the new regulations of the MOI can partly go through the lengthy procedures in this Act.