

## Chapter 8

# Clustering and Public–Private Partnerships: The Tools of Municipal Solid Waste Management Reformation in Thailand

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### Abstract

Municipal solid waste (MSW) is one of the main problems in Thailand. Since 2014 the government considered MSW as an urgent issue in the country. The Thai government started plans to cope with this problem. Clustering areas of municipality for MSW management and public–private partnerships (PPP) have been selected as the main tools for solving the problem of MSW in Thailand. The idea behind these policies contradicts the traditions of Thai MSW management, which is mostly governed by single local administrative organisations (LAO), and private companies only do service contracts. The Thai government encourage LAOs to cooperate as clusters for MSW management. Resources, standards, and technology are used by the central government to encourage LAOs to cluster. However, the limitations of cooperation and the centralised power of the Thai government create inefficiency in a clustering policy. Since 2014 some private companies started to undertake PPP projects in MSW management. The regulations, technology, clustering, and limitation of LAOs' budgets force LAOs and private companies to cooperate in MSW management. However, it is not convenient for small clusters to carry out PPPs. This leads to the question of whether PPPs and clustering in MSW management are suitable policies for every kind of LAO and cluster.

**Keywords:** Solid waste management, public–private partnership, Thailand, clustering, local government

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## 8.1. Introduction

### 8.1.1. Reformation of Municipal Solid Waste Management in Thailand

The Thai government announced municipal solid waste (MSW) as an urgent issue in Thailand in 2014. An enormous volume of untreated MSW all over Thailand is a reason why the government decided to take serious action on MSW.<sup>37</sup> During the Junta period of General Prayuth (2014–2019), the government created a master plan, regulations, and organisations to cope with the crisis of MSW.

**Table 8.1: Important Actions of Thai Government for Municipal Solid Waste Management Between 2014 and 2019**

Since	Actions	Result
2014	MSW was announced as an urgent issue of Thailand	Roadmap of MSW and hazardous waste management
2014	Reorganisation of the structure of MSW governance	Ministry of Interior became the main actor for MSW management and Ministry of Natural Resources and Environment became the planner <sup>(i)</sup> Committees for MSW management at national and provincial level in 2017. Committees for MSW management at district and local administrative level in 2019 <sup>(ii)</sup>
2014	Support PPP for waste management <sup>(iii)</sup>	There are at least 11 new PPP projects as a result of this policy. These new PPP projects plan to operate in 2020 <sup>(iv)</sup>
2015	Clustering local administrative organisations (LAOs) for MSW management <sup>(v)</sup>	Group over 700 LAOs into 324 clusters for waste management in 2018 and this number reduced to 262 cluster in 2019.
2016	National Solid Waste and Hazardous Waste Management Master Plan (2016–2021)	Promote appropriate technology for garbage and waste management – sanitary landfill, a semi-aerobic landfill, fermentation for biogas production, fermentation for fertiliser, refuse derived fuel technology, and an incineration/combustion system Promote specific law for MSW management Promote cooperation amongst LAOs for waste management
2018	Act on the Maintenance of the Cleanliness and Orderliness of the Country, B.E. 2560 (2018)	Establish MSW management committee Adjust limitation of tipping fee Guideline for subcontract and PPP for waste management

<sup>37</sup> In 2015, the estimated volume of MSW in Thai was around 26.85 megatons; however, around 10.46 megatons was untreated. Mover, half of the treated MSW was in improper waste treatment sites, such as open dumping areas (Pollution Control Department, 2017).

	Notification of the Ministry of Interior Municipal Solid Waste Management, B.E. 2560 (2018)	Guideline for cooperation between LAOs in MSW management
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LAO = local administrative organisation, MSW = municipal solid waste, PPP = public–private partnership.

Notes: (i) Cabinet Resolution 12/05/2015, (ii) According to the Act on the Maintenance of the Cleanliness and Orderliness of the Country, B.E. 2560, Cabinet Resolution 16/06/2015, (iii), Resolution of National Council for Peace and Order 26/08/2014, (iv) Nutdanai, 2019, (v) Cabinet Resolution 16/06/2015.

Source: Prepared by author.

As shown in Table 8.1, there are several policies have been activated to cope with the problem of MSW. For the reorganisation, the Department of Local Administration, the Ministry of Interior become the main actor for waste management in Thailand because this department supervises local administrative organisations (LAOs), which are the real operators of MSW management in Thailand. The Ministry of Natural Resources and Environment became the policy planner, and the *National Solid Waste and Hazardous Waste Management Master Plan* was the first result of this reorganisation. The new committees are set by the authorities of the Act on the Maintenance of the Cleanliness and Orderliness of the Country, B.E. 2560 (2018). These committees became an important policymaker, because every high-value PPP waste management project needs to get approval from the national committee. Not only is reorganisation an important issue, but the government also promotes PPPs and clustering in MSW management as the tools to improve the situation of MSW in Thailand. These two policies were mentioned at every interview of the minister of interior (e.g. Nutdanai, 2019; Raising Funds through Green Bond, 2019), in the *National Solid Waste and Hazardous Waste Management Master Plan* (2016–2021), and in both new regulations for MSW management. Therefore, this research intends to investigate why the government is eager to promote these two tools, what are the limitations of PPPs and clustering in the case of Thailand, and finally whether these two policy methods are suitable for every area in Thailand. This research will start with a discussion about clustering, followed by a focus on PPPs.

## 8.2. Clustering and Municipal Solid Waste Management in Thailand

Clustering is a kind of a centralised system of MSW management. For a centralised system, multiple organisations that govern MSW in their own areas cooperate for MSW management, especially sharing waste treatment sites. This system is opposite to the decentralised system, where each organisation takes care of MSW in their own area separately. There are pros and cons of these two systems, such as operational cost,

constructional cost, and transportation cost.<sup>38</sup> Centralised waste treatment benefits economies of scale. Therefore, its operational cost is lower than decentralised waste treatment at the same volume. This is the main reason why several organisations prefer centralised waste treatment systems.

These days MSW management in Thailand is in a transition process to the cluster system, which is a kind of centralised waste management. The central government of Thailand motivates LAOs to group into clusters in order to manage waste together. Each cluster has a host organisation that can be the biggest LAO in the cluster or the provincial administrative organisation (PAO). These hosts need to manage their waste treatment sites. However, clustering is not a new tool for MSW management in Thailand. In the past, some areas in Thailand did practice clustering before the central government started to promote this policy in 2014. Since 2014, however, the Thai government has blamed decentralised waste treatment as a root of the MSW issues in Thailand and wants to reform MSW management. Section 8.2 will discuss the basic structure of MSW management in Thailand, the reason behind the clustering policy, and the limitation of clustering.

### **8.2.1. Structure of Municipal Solid Waste Operation in Thailand**

LAOs are the main operators for MSW management in Thailand. LAOs can be classified into two levels, provincial level and sub-district level. At the provincial level the PAO takes care of the whole province and supports the LAOs for the services that they cannot operate. The sub-district level LAOs can be grouped into two kinds – *Thesabans* and *Tambon* administrative organisations (TAOs). *Thesabans* govern the urban areas, whilst TAOs take care of the rural areas. They are almost same but have different structures and responsibilities.<sup>39</sup> However, their responsibilities in waste management are similar to each other. By this way of local governance, MSW in Thailand can be classified into two ways of management:

- 1) **Single *Thesaban* or TAO system:** this kind of MSW management was common in the past. Each *Thesaban* or TAO manages its own MSW through the three processes of waste management – collection, shipment, and disposal. Some LAOs own waste treatment sites, but some send their MSW to private waste treatment sites. Although these days the clustering policy drives LAOs to cooperate in waste management, some LAOs resist and operate their own MSW management.

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<sup>38</sup> For more information see Wilderer and Schreff, 2000.

<sup>39</sup> For more information see Funatsu, 2019.

Sometimes clustering makes it harder for LAOs to provide MSW management because the distance between the LAOs and the sites is too far, some clusters are not ready to share the waste treatment sites, or some waste treatment sites are waiting for licences from the central government. For example, in the case of Nakhon Sawan and Phichit Provinces, some LAOs did not practice MSW management of the cluster system, and the hosts of some clusters did not own their waste treatment site (State Audit Office of the Kingdom of Thailand, 2019). In the case of Phitsanulok Municipality, the central government forced the municipality to share their own waste treatment sites with nearby LAOs, but this sharing led to local resistance and the waste treatment site was shut down (Petkanjanapong, 2019).

- 2) **Cluster system:** In this system, LAOs cooperate with nearby LAOs for MSW management. Before 2014, some LAOs already practiced clustering MSW management, such as the waste treatment sites of Phuket Municipality, or the waste treatment sites of the Nonthaburi provincial organisation. In these two examples, each single waste treatment site receives MSW from their whole province. There are other waste treatment sites that are operated by a single municipality, but received MSW from nearby LAOs not the whole province, such as the waste treatment sites of Nakhon Ratchasima Municipality and Loei Municipality. Remarkably, for most clusters, the members cooperate only on waste treatment sites. There are a few of them that cooperate in reduce, reuse, and recycle (3R) activities or garbage collection. Since 2014, the clustering system has become a tool of MSW management that the central government wants to promote.

### 8.2.2. Constraints of Clustering

Clustering of MSW management in Thailand is driven mainly by the central government policy. However, there are still some LAOs who resist joining the cluster system. Therefore, the central government uses several policy tools to create conditions that motivate LAOs to join their cluster.

- 1) **Resources:** Economies of scale are why the central government tells the public that LAOs need to practice clustering for MSW management. Local governments are generally faced with budget shortages. In the 2006 Decentralization Plan Act, the central government promised to allocate at least 35% of the national budget to local governments; however, this plan was not successful and the goal was changed in 2007 to only 25% of the national budget. In 2019, 29.5% of the national budget was allocated to local governments, although it is higher than the goal in 2007 but still

less than the first goal in 2006 (Kovit, 2019). By this budget limitation, it is impossible for a single LAO to afford the construction fees and operational fees of MSW treatment sites without financial support from the central government. By this dependence, LAOs need to follow the policies of the central government in MSW management. Moreover, clustering can increase the size of waste treatment sites and the daily volume of MSW, which is attractive to private companies to invest in the project and reduce the financial cost of MSW treatment for LAOs.

- 2) **The standard of waste treatment sites:** In the past, MSW management in Thailand was purely operated by LAOs and the central government had a role as an auditor. Before 2016, there were not any standards for MSW management in Thailand (Local Administration Department, 2019). Improper waste treatment sites sometimes create negative effects to the surrounding community. This impact can reduce the quality of life, health, and economy of the local people. Negative impacts can lead to local resistance to the waste treatment sites. In 2016, there were 23 waste treatment sites that could not operate – although the construction was already finished – because of local resistance to the waste treatment sites (Pollution Control Department, 2017). Shutting down waste treatment sites is a problem because it can create a chain negative effect. For example, in the case of Phitsanulok Province, the central government shut down multiple landfill sites of LAOs because they were below standard. These LAOs need to use the landfill sites of Phitsanulok Municipality. The sudden increase in garbage in the Phitsanulok Municipal landfill sites created severe negative impacts to the local people, such as flies, smell, and accidents. This situation led to shutting the landfill site because of local people’s anger (Petkanjanapong, 2019). In order to avoid this problem, the central government set the standard for MSW treatment sites. However, the standard is also used as a tool to shut down low-standard sites and force the LAOs to use other sites of nearby LAOs. This is how clusters of MSW management have been created.
- 3) **Technology:** The central government prefers waste-to-energy (WTE) technology, especially incineration. One reason is because of local resistance to new waste treatment sites. Therefore, developing an incinerator over an old full landfill site can release the social pressure. Moreover, the government believes that incineration technology is more sustainable and cleaner than sanitary landfill (Secretariat of the House of Representatives, 2019). However, incineration technology requires a huge volume of daily MSW in order to keep the incinerators operating efficiently.

Therefore, clustering MSW can provide enough volume of daily MSW for incinerators.

Decentralised MSW management is blamed as a root of inefficient MSW management in Thailand. Therefore, the central government forces LAOs to group MSW management by using economic conditions, standards, and technology.

### **8.2.3. Limitation of Clustering for Municipal Solid Waste Management in Thailand**

Today clusters of MSW management are in every part of Thailand. However, the success of the policy is still in doubt. One reason is because some LAOs refuse to join their clusters, another reason is problems of untreated waste in many waste treatment sites still exist even in the waste treatment sites of cluster systems. This research argues that there are at least two main factors that prevent success of the clustering policy – limitation in cooperation amongst members of each cluster and the centralised power of decision making by the Thai government.

- 1) **Limitation in cooperation:** It is clear that cooperation amongst LAOs is limited at the disposal process. Only a few clusters, such as the Rayong municipality area, the LAOs share transportation. If the LAOs can cooperate for other MSW management activities such as garbage trucks, or 3Rs, they might reduce the operational cost as well as the volume of daily garbage.
- 2) **Centralisation of decision making:** Although the central government allows LAOs to group clusters by themselves, the government forces LAOs to cluster and only in the same province. If any LAOs need to cooperate outside the province, they need to get approval from the central government via a long procedure. Moreover, sometimes the central government rushes LAOs to cluster because the Ministry of Interior wants to see progress. This way of clustering is inefficient because it does not go through the process of negotiation amongst LAOs. Before 2014, in contrast, the clusters of MSW management were established because each LAO considered the need for cooperation. Besides, they did not limit it by territory of province. For example, in the case of the Nonthaburi Provincial waste treatment site, MSW from some areas of Pratumthai Province are sent to the site (Petkanjanapong, 2019).

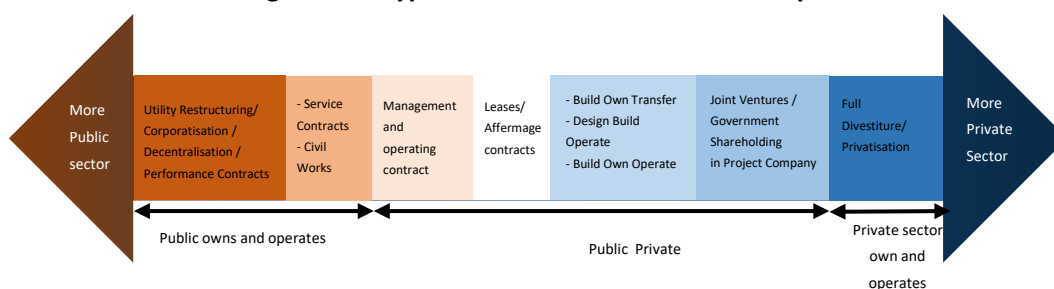
These two limitations contradict the central government policy. Whilst the government clearly promotes the process of 3Rs as a main tool for solving the problem of MSW, clustering is used only for the purpose of disposal. Moreover, the central government disregards the authority of the LAOs in MSW management, and forces LAOs to cluster. Cooperation and clustering should be established by the needs of local people and the LAOs.

### 8.3. Public–Private Partnerships for Thai Municipal Solid Waste Management

Clustering is not the only tool used by the Thai government to fix the urgent problem of MSW; public–private partnerships (PPP) are another tool used by the Thai government. The government believes that larger MSW management systems will attract more private companies to join the activities of MSW management. Therefore, it is fair to say that it is impossible to discuss each tool without mentioning their relationship with the other.

PPPs are a cooperative arrangement between government agencies and private companies. Generally, the arrangement is for providing any kind of public services (Caves, 2004). PPPs are a tool for funding infrastructure or services that the government face with inadequate budget. There are several ways of arrangement that count as PPPs. Different levels of PPPs are shown in Figure 8.1.

**Figure 8.1. Types of Public–Private Partnership<sup>40</sup>**



Source: Public–Private Partnership Legal Resource Center (2019); Wojewnik-Filipkowska and Wegrzyn (2019).

According to Figure 8.1, a project can be considered as a PPP project whenever the private company that operates the project, takes benefit from the public or other sources not only from the government organisations with whom make the arrangement. In the case of Thailand, the definition of PPP in the Public–Private Partnership Act, B.E. 2562 (2019) is not different from this general meaning. However, the act is only for projects that are over ฿5,000 million in value.<sup>41</sup> For the Thai government, PPP is a tool for funding public projects, and also a tool for transferring risk in a project to private companies because government organisations do not have the skills, technology, and labour that private companies have (Parliamentary Budget Office, 2016). However, PPPs for MSW consist of their own specific detail. In this next section, the role of the private company, conditional

<sup>40</sup> There is no consensus about types of PPPs. Some studies discuss levels of private involvement of each type of PPP (e.g. Public-Private-Partnership Legal Resource Center [2019]; Wojewnik-Filipkowska and Wegrzyn [2019]).

<sup>41</sup> The old Public–Private Partnership Act, B.E. 2556 (2013) set the minimum project value of a project at ฿1,000 million.



PPPs, and limitation of PPPs in Thai MSW management will be discussed.

### **8.3.1. Roles of the Private Sector in Thai Municipal Solid Waste Management**

In case of MSW, there are several projects that could be considered as PPPs before 2014, such as the Phuket Municipal waste treatment site. This project, undertaken by the PJT company as a build–operate–transfer (BOT) project in 2011, used incineration technology (Vanapruk, 2017). However, centralised waste treatment systems were not common until 2014. Therefore, there are only few waste treatment sites that are large enough for PPPs. Even the Nonthaburi provincial waste treatment site which received larger volumes of daily MSW than the Phuket municipality waste treatment site also did not do PPPs during that time. Before 2014, in other words, the role of private companies in MSW management was limited to civil works and service contracts. Only large MSW management systems, such as the Bangkok Metropolitan Administration or Phuket undertook PPPs. However, after 2014, the clustering process started, and the central government motivated each cluster to conduct PPPs to reduce the financial support needed from the central government. Therefore, this next part will discuss the situation of private company in both roles – contractor and PPP operator.

- 1) **Service contracts:** The role of the private company is common in Thailand. Although the central government has motivated LAOs to undertake PPPs with private companies to reduce the cost of MSW management since 2014, between 2015 and 2019, LAOs have hired private companies for least 535 contracts, with a value of around B4.9 thousand million, with B3.9 million for disposal projects, whilst the rest is for MSW collection (Isranews, 2018).
- 2) **PPP:** Waste treatment is one main activity that private companies undertake with the government for MSW management. There are PPPs between private companies and every level of government – national, provincial, and sub-district level; for example, PPP Plastic – the cooperation between multiple government agencies and private companies in managing plastic waste, a PPP between the Rayong Provincial Administrative Organisation and GPSC company for a WTE incinerator, and a PPP between PJT company and Phuket municipality. Most large PPP projects relate to WTE or incinerators that the central government have promoted since 2014.

Service contractors still have important roles in private companies, although PPPs are promoted by the central government. A reason is because PPPs are more suitable for large waste management systems that can return the benefit to their investors. However, for small clusters and single LAOs service contracts are still the only way to bring private

companies to operate MSW management.

### **8.3.2. Public–Private Partnerships and Conditions of Thai Municipal Solid Waste Management**

Thailand is still in the transition period for MSW management and PPP. There are some elements that can support PPP in MSW management, namely regulations, technology, size of waste management system, and limitation of budget.

- 1) **Regulation:** The Thai government has promoted PPPs since 2013 when it brought into law the Public–Private Partnership Act, B.E. 2556 (2013), and established the state enterprise policy office that supports PPPs. The government also provides clear guidelines for LAOs and private companies who want to undertake PPPs. The act provides more a convenient procedure. Moreover, the government also provided extra funds for creating a strategy plan of the project (Parliamentary Budget Office, 2016). Nevertheless, the standard of MSW management that was set by the central government after 2014 is higher than the ability of LAOs, therefore PPP is a tool of the LAOs to follow the new standards to get resources, such as budget, skills, and personnel from the private sector.
- 2) **Preferred technology:** According to the previous discussion about technology, the central government prefers WTE or incinerators over open dumping or landfill. WTE and incinerators require higher technology and knowledge than the PAOs can afford. Therefore, they need to undertake PPPs with private companies, and use private companies' resources to build and operate technology for MSW management.
- 3) **Size of waste management system:** After 2014, the Thai government motivated LAOs to cooperate as clusters for MSW management. This policy increases the size of each MSW management system, budget, and also volume of daily MSW. The bigger system of MSW management attracts private companies to invest in the MSW projects.
- 4) **Limitation of LAOs' budget:** As discussed in the section on clustering, LAOs have inadequate budgets compared to their duties. Therefore, investors in any kind of public service are welcome. Moreover, it is the intention of the central government that wants to reduce the budget for MSW management and transfer the cost to the private sector via PPPs (Nutdanai, 2019).

MSW management in Thailand has opened up to PPPs by regulation changes, the size of MSW management system, and the technology. However, these conditions do not suit everyone. Small LAOs and clusters have to face barriers that prevent them using PPPs for

their MSW management.

### **8.3.3. Limitation of Public–Private Partnerships in Thai Municipal Solid Waste Management**

Although there are several new PPP projects for MSW management, there are some limitations of PPP in Thailand, and these lead to inefficient cooperation between private companies and state agencies for waste management.

- 1) **Complications of the Thai administrative system:** High-value PPP projects can go through a fast-track procedure because of the Public–Private Partnership Act. This fast track requires only around six steps<sup>42</sup> (State Enterprise Policy Office, 2015). However, the lower-value projects need a longer process. The procedure of low-value PPPs requires 14 steps<sup>43</sup> (Ministry of Interior, 2015). In other words, larger MSW management clusters can more easily undertake PPPs than smaller clusters. This reduces the chance of small clusters to do PPP with the private companies. Small clusters lead to small volumes of resources and are less attractive than large clusters for PPPs, but they still need to use their limited resources for dealing with the complicated process. In other words, the PPP policy of the central government benefits large clusters of MSW management.
- 2) **Private and public benefit:** The conflict between public and private benefits is one of the classic debates for PPPs because private companies who invest in MSW management need to worry about their own benefit over public benefit. This situation might lead to negatives impact in the surrounding community because private companies need to save the cost. Sometimes LAOs cannot audit a project well because MSW treatment is about the technology and skills. For example, in the case of Hatyai Municipality, people who live near the incinerator are negatively impacted by the waste treatment sites, such as bad smells and dust. However, it is still in operation after 4 years (Channel 7, 2020).

In order to increase numbers of PPPs, the government might need to create more convenient procedures for low-value projects. Therefore, small clusters of MSW management can use PPPs as a tool to increase their ability in MSW management. To reduce public doubt in PPPs, the central government needs to take the action on any PPP project that create negative impacts on the local people.

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<sup>42</sup> See Appendix 1.

<sup>43</sup> See Appendix 2.

## 8.4. Conclusion

Since 2014, there have been several changes in Thailand's MSW management, such as introducing new regulations, setting up an MSW management committee, implementing a master plan, and reorganising waste management procedures. However, amongst these changes, clustering and PPPs are the most important in MSW management. PPPs and clustering policies are expected as the tools to solve one of the protracted problems in Thailand. These two policies are designed to support each other. They are based on the concern of the limitation of resources. Clustering leads to an increase in resources of LAOs, expands the size of waste treatment systems, and also reduces the operational cost by economies of scale. The larger size of MSW management systems means more resources and larger volumes of daily MSW. These two elements attract private companies to invest in MSW management. It might be too soon to evaluate if these two policies are successful. There are some cases in Thailand where PPPs and clustering can create efficient MSW management, such as the case of the Rayong PAO and Phuket Municipality. However, in the case of small clusters, it is doubtful whether these policies can create a suitable MSW management system. Small clusters do not attract private companies, and the procedure for small PPP projects are more inconvenient compared to high-value PPP projects. Moreover, some small clusters cannot even form their own clusters. It might be time for the Thai government to rethink the limitations of clustering and PPPs. These two policy tools might not be suitable for some parts of Thailand, such as small clusters or small and distant LAOs.

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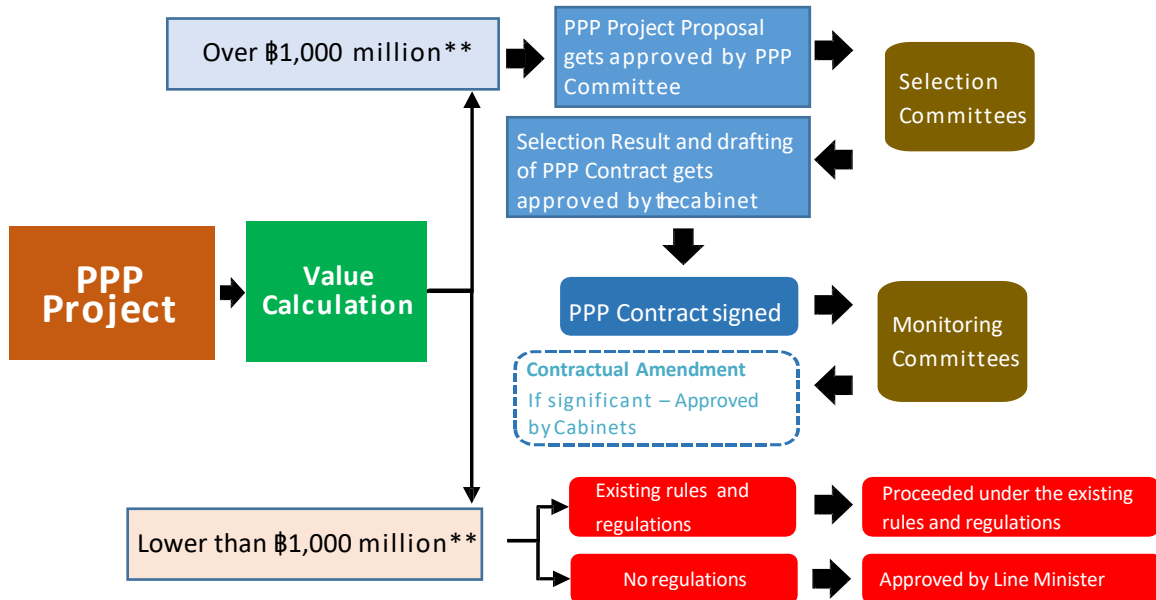
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**Appendix 1. Overall Procedure of PPP in Thailand (State Enterprise Policy Office, 2015;  
Private Investments in State Undertakings Act B.E. 2556, 2013; Public-Private  
Partnership Act B.E. 2562, 2019)**



PPP = public-private partnership.

\* This Act has been replaced by the Public-Private Partnership Act, B.E. 2562 (2019). The new law specifies limited kind of public services that will go through this procedure, and the new law also adjusted the minimum value of project.

\*\* Public-Private Partnership Act, B.E. 2562 (2019) increases the minimum value PPP project to B5,000 million.

**Appendix 2: Overall Procedure of PPP in MSW Management under ฿1,000 million  
(Ministry of Interior, 2015)<sup>44</sup>**



LAO = local administrative organisation, MSW = municipal solid waste, PPP = public–private sector.

<sup>44</sup> Public–Private Partnership Act, B.E. 2562 (2019) increased the high-value PPP projects to ฿5,000 million; however the procedure for this new plan has not yet been released as of June 2020.