

Policy and Regulations – Bangkok (Thailand)

1.1 Overview of Regulatory Framework

The regulatory framework related to solid waste management (SWM) in Thailand can be classified into three levels which are the National, Provincial and Local levels. There are numbers of Laws/Acts, Regulations, Standards, and Technical Guidelines to overlook the management of sold waste in the country. Significant items have been summarized in Table 1.

Table 1: Summary of regulatory framework related to SWM in Bangkok area

| Focal Area | Policies | Laws/ Acts | Regulations/Standards/ Guidelines | Economic Instruments |
|----------------|-----------------------------------------------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|
| Overall | National Solid Waste Management Policy | The Constitution of the Kingdom of Thailand B.E.2550 (2007) | None | None |
| | Framework for Country's Environmental Quality | The Enhancement and Conservation of National Environmental Quality Act (NEQA), 1992 | <ul style="list-style-type: none"> • Ministerial Regulation: # 9 (1998) Issued in the Royal Gazette Dated 25 December 1998. • Notification of the Ministry of Science, Technology and Environment, Issued under the NEQA, and published in the Royal Gazette Dated 7 August, 1997. | None |

Extract of the report "Converting Waste Plastics into Fuel - Report on Situation Analysis of Existing Solid Waste Management System for Bangkok Metropolitan Area"

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|-----------------------------------------------|------|-------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| | | | <ul style="list-style-type: none"> • Notification of the Ministry of Science, Technology and Environment #3, Issued under the NEQA, and Published in the Royal Gazette Dated 13 February, 1996. • Notification of the Ministry of Science, Technology and Environment, Re: Specifying Conditions, Procedures and Guidelines for Preparing Reports on Environmental Impact Assessment. | |
| Sanitation and disposal of solid waste | None | Public Health Act, 1992 | | |

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|------------------------------------------|-------------|------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| <p>Household waste management</p> | <p>None</p> | <p>Public Cleanliness and Orderliness Act (PCOA), 1992</p> | <ul style="list-style-type: none"> • BMA Ordinance: Disposal of Garbage, Refuse and Unclean Thing 1978 • BMA Ordinance: Disposal of Garbage, Refuse and Unclean Thing 1978 • BMA Ordinance: Specifying Requirements for Construction of Building and Public Utilities 1996 • BMA Ordinance: Control of Waste Collection, Haulage, or Elimination Business which is made for Consideration as Service Fee 1998 | |
|------------------------------------------|-------------|------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|

Policy and Regulations – Bangkok Metropolitan Area (2009)

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|-----------------------------------|---------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| Industrial Waste | <ul style="list-style-type: none"> • National master plan on the cleaner production and cleaner technology | Factory Act, 1992 | <ul style="list-style-type: none"> • Notification of the Ministry of Industry Concerning Factory Wastes 1988 | |
| Hazardous Waste Management | | <p>Hazardous Substance Act, 1992</p> <p>Hazardous Substance Act, 2001</p> | <ul style="list-style-type: none"> • Notification of Ministry of Industry Concerning Storage and Disposal of Toxic Substances 1982 • Poisonous Substances Act 1967, amended in 1973 • Notification of Ministry of Industry Concerning Industrial Effluent Standards 1982 • Notification of Ministry of Industry concerning manufacture and use of toxic substances 1982 • Notification of Ministry of Industry Re: Hazardous | |

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|---------------------------------------------|------------------------------------------------------------|-----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|------|
| | | | waste manifest system B.E. 2547 (2004) | |
| Source Reduction | Strategic Plan on Packaging and Packaging Waste Management | Industrial Estate Act, 1979 | | |
| | None | Construction Building Control Act, 1979 | | |
| | None | City Planning Act 1975 | | |
| Segregation of waste | None | None | None | None |
| Transportation and Transfer Stations | None | None | BMA's Technical Guideline for Solid Waste Operator | |
| Landfills | None | Factory Act, 1992 | <ul style="list-style-type: none"> Notification of Ministry of Industry Concerning Storage and Disposal of Toxic | |

Extract of the report "Converting Waste Plastics into Fuel - Report on Situation Analysis of Existing Solid Waste Management System for Bangkok Metropolitan Area"

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|--------------------|------|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| | | | Substances 1982 | |
| Incinerator | None | | <ul style="list-style-type: none"> • Notification of the Ministry of Science, Technology and Environment B.E.2540 (1997) dated June 17, B.E.2540, published in the Royal Government Gazette, Vol. 114 Part 63, dated August 7, B.E. 2540 (1997) • Notification of the Ministry of Science, Technology and Environment B.E.2540 (1997) dated June 17, B.E.2540, published in the Royal Government Gazette, Vol. 114 Part 63, dated August 7, B.E. 2540 (1997) • Notification of Ministry | |

Extract of the report "Converting Waste Plastics into Fuel - Report on Situation Analysis of Existing Solid Waste Management System for Bangkok Metropolitan Area"

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| | | | <p>of Natural Resource and Environment : Emission Standard for Infected Waste Incinerator published in the Royal Government Gazette, Vol. 120 Special Part 147 D, dated December 25, B.E. 2546 (2003)</p> <ul style="list-style-type: none">• Notification of Ministry of Natural Resource and Environment : Infected Waste Incinerator is designated as Pollution Point Source which its emission must be controlled published in the Royal Government Gazette, Vol. 114 Special Part 147 D, dated December 25, B.E. 2546 (2003) | |
|--|--|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|

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|------------------------------------|------|------|----------------------------------------------------------|--|
| Recycling | None | None | None | |
| Resource Recovery | None | None | None | |
| Construction and Demolition | None | None | C&D waste is considered as part of municipal solid waste | |

1.2 Description of Regulatory Framework on Solid Waste Management

1.2.1 National Level

(A) National Environmental Policies and Plans

(A.1) Thai Government's Policies

Regarding to the Natural Resources and Environmental Policy, the Government will implement an environment-friendly waste disposal system and enhance waste disposal capacity of local administrative authorities. The Government will also promote the private sector's role in research and development for recycling of raw material and clean technology. In addition, the Government will not allow Thailand to become an end receiver of waste, which has to bear the costs of industrial waste and pollution.

(A.2) National Integrated Waste Management Policy

All important aspects in governing the country normally follow the set of policies formulated. Solid waste management, with no exception, has to move toward national solid waste management policy. The policy is developed for integrated solid waste and waste water management. The policy aimed to minimize waste generation by promoting 3Rs hierarchy including promotion of source reduction and separation, waste stream recovery for composting, material and energy uses. Biogas, heat and electricity generated in the processes can be used in waste water treatment plant. In terms of waste treatment facilities, more effort shall be put towards an establishment of central solid waste management disposal facilities with appropriate technology, privatization of services may be needed in order to achieve high efficiency. The country shall implement the integrated waste management system based on waste to energy concept (Figure 1). Additionally, participation between public and private sectors is also emphasized.

In terms of policy implementation, the management of solid waste employs Polluter Pay Principles (PPP) for all sectors in society. Privatization or

concession of services is also used as means to achieve effective solid waste management. Data base for waste management system shall be updated and informed to all parties involved. Provincial government shall be responsible for the preparation of land area to be used as long term waste treatment facilities.

As for the implementation of law and regulation measures, related documents should be revised especially in terms of service fee, subsidy schemes for waste reduction, and the promotion of local community participation in waste management and monitoring of environmental quality are emphasized.

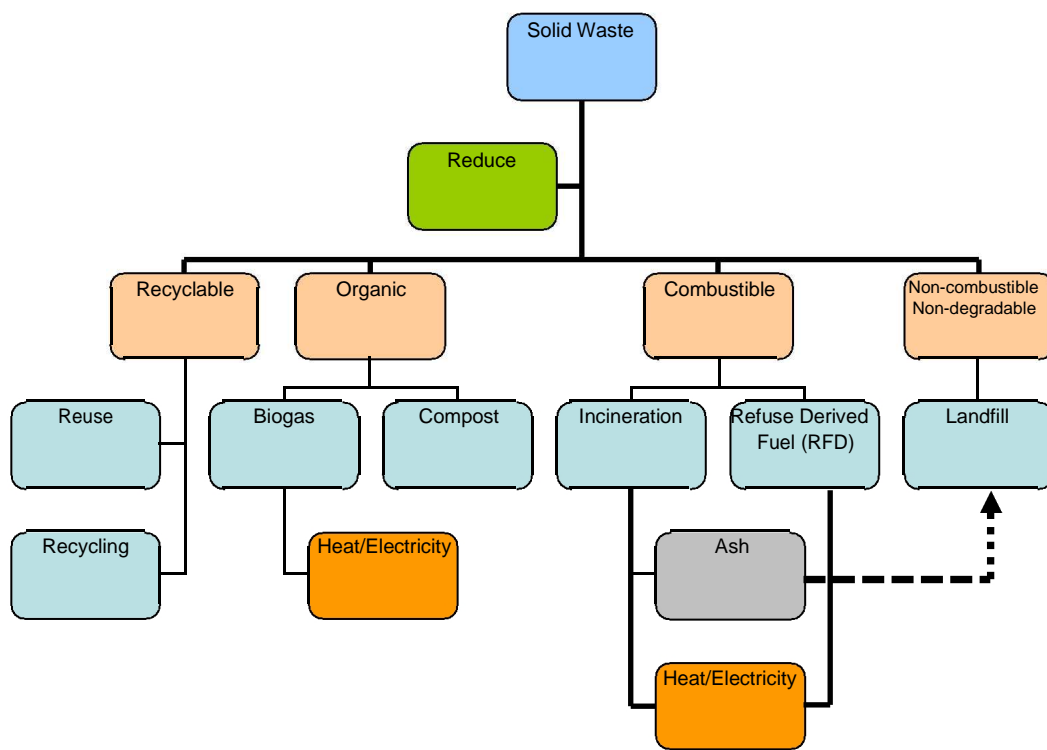


Figure 1: Integrated waste management scheme based on waste to energy concept

Other kinds of implementation measures are promotion of environmental education, research and development in environmentally sound technologies, capacity building for government officers and related private sectors, and environmental awareness raising for youths and local public.

(A.3) National Master Plan on the Cleaner Production and Cleaner Technology

For industrial waste management, the plan promoted the cleaner production and cleaner technology in order to minimize pollutions from the production line and other industrial activities as well as the pollutions or hazardous substances in the product itself. In this regard, projects on waste reduction in pulp and paper industry and in the plastic industry have been initiated.

(B) National Regulatory Framework

(B.1) The Constitution of the Kingdom of Thailand B.E.2550 (2007)

According to The Constitution of the Kingdom of Thailand B.E.2550 (2007), environmental management is different from the previous constitutions. This law provides the public right to participate the prevention and elimination of any actions that is to deteriorate natural resources and to pollute the environment, some of the sections related to this statement are as follows;

- **Section 57** A person shall have the right to receive data, explanations and reasons from a Government agency, a State agency, a State enterprise or a local government organization prior to the approval or the operation of any project or activity which may affect the quality of the environment, health and sanitary conditions, the quality of life or any other material interest concerning such person or a local community and shall have the right to express his or her opinions to agencies concerned, for assisting further consideration of such matters.

In planning social, economic, political and cultural development, or in undertaking expropriation, town and country planning, zoning and making by-laws likely to have impacts on essential interests of the public, the State shall cause to be held comprehensive public hearings prior thereto.

- **Section 66** Persons so assembling as to be a community, a local community or a traditional community shall have the right to conserve or restore their customs, local knowledge, good arts and culture of their community and of the nation and participate in the management, maintenance, preservation and exploitation of natural resources, the environment and the biological diversity in a balanced and sustainable fashion

- **Section 67** The right of a person to give to the State and communities participation in the conservation, preservation and exploitation of natural resources and biological diversities and in the protection, promotion and preservation of the quality of the environment for regular and continued livelihood in the environment which is not hazardous to his or her health and sanitary condition, welfare or quality of life, shall be protected as appropriate.

- **Section 85** The State shall pursue directive principles of State policies in relation to land, natural resources and the environment, as follows:
 - (1) to prescribe rules on land use which cover areas throughout the country, having regard to the consistency with natural surroundings, whether land areas, water surfaces, ways of life of local residents, and the efficient preservation of natural resources, and prescribe standards for sustainable land use, provided that residents in areas affected by such rules on land use shall also have due participation in the decision-making;

 - (2) to distribute land holding in a fair manner, enable farmers to have ownership or rights in land for farming purposes thoroughly through land reform or otherwise, and provide water resources for sufficient use of water by farmers in a manner suitable for farming;

- (3) to provide town and country planning and carry out the development and action in the implementation of town and country plans in an efficient and effective manner in the interest of sustainable preservation of natural resources;
 - (4) to provide a plan for managing water resources and other natural resources systematically and in a manner generating public interests, provided that the public shall have due participation in the preservation, maintenance and exploitation of natural resources and biological diversity in a balanced fashion;
 - (5) promote, maintain and protect the quality of natural resources in accordance with the sustainable development principle, control and eradicate polluted conditions affecting health, sanitary conditions, welfare and the quality of life of the public, provided that members of the public, local residents and local government organizations shall have due participation in determining the direction of such work.
- **Section 290** A local government organization has powers and duties in connection with the promotion and maintenance of the quality of the environment as provided by law. The law under paragraph one shall at least contain the following matters as its substance:
 - (1) the management, preservation and exploitation of the natural resources and environment in the area of the locality;
 - (2) the participation in the preservation of natural resources and environment outside the area of the locality only in the case where the livelihood of the inhabitants in the area may be affected;
 - (3) the participation in considering the initiation of any project or activity outside the area of the locality which may affect the quality of the environment, health or sanitary conditions of the inhabitant in the area;
 - (4) the participation by local communities.

(B.2) The Enhancement and Conservation of National Environmental Quality Act (NEQA) 1992.

At the national level, the NEQA of 1992 is the basic environmental protection law for the country and establishes the role of Ministry of Natural Resources and Environment (MNRE) in environmental planning, standard setting, and monitoring. Key points in the NEQA 1992 include the following points.

- the provision of the right of individuals to information, compensation and redress against violators, and the duty of individuals to assist and cooperate in enhancing and protecting the environment;
- a recognition of the role and standing of environmental NGOs;
- the provision for the Prime Minister or the delegated provincial governor to deal with emergencies or public danger arising from natural disasters or environmental pollution;
- the creation of a high-level multi-representational National Environmental Board (NEB) to oversee the coordinated response of ministries *inter se* and between central and provincial authorities;
- the reconstruction of environmental related agencies by setting up the Office of Environmental Policy and Planning (OEPP), Pollution Control Department (PCD), the Department of Environmental Quality Promotion (DEQP);
- the establishment of an Environmental Fund from which resources will be drawn to combat environmental incidents and to enhance environmental protection efforts like research and training, disbursements of loans and grants, education, NGO funding etc. The fund provides grants to governmental agencies and low-interest loans to the private sectors who are engaged in the activities related to the improvement of the environment;

- the formulation of a National Environmental Management Plan and the subsequent duties of government agencies to implement the Plan and of provinces to draw up corresponding Provincial Action Plans, if required;
- the provision for the NEB to declare Pollution Control Areas (PCAs) in localities where particularly serious pollution concerns have arisen - contingent upon the declaration of a PCA, special measures may be taken to redress the problem in the area concerned, and a duty is henceforth imposed upon the provincial governor to draw up a Provincial Action Plan to redress the situation;
- the provision for the declaration of Conservation and Environmentally Protected Areas in environmentally-fragile areas where special measures can be taken to protect sensitive natural ecosystems and wherein a Provincial Action Plan would have to be formulated by the provincial governor to address the concerns;
- the provision for the NEB to assume jurisdictional competence over provinces where the provincial authorities demonstrate an unwillingness or incapacity to deal with a particular incident or to come up with suitable provincial plans;
- the prescription of a fairly-detailed environmental impact assessment (EIA) process which incorporates public participation and views of experts in decision-making;
- the establishment of a multi-agency Pollution Control Committee to oversee pollution control matters, including the enactment of discharge standards;
- the regulation of air, noise, water and hazardous waste pollution, as well as other forms of pollution;
- the duty to use central waste treatment facilities, the expense for which is borne by the user (pursuant to the "polluter pays" principle);

- the prescription of various civil, criminal and administrative remedies for environmental violations.

When focusing on solid waste management issue, it specifies the role of the municipality in: managing solid waste management, contracting out solid waste management services to the private sector where needed, and charging fees in accordance with ministerial regulations. The environmental fund can be used to finance solid waste investments proposed by local governments. As for industrial and hazardous wastes, the management is emphasizing on environmental planning and environmental quality standards and monitoring as well as the establishment of EIA system, which applies to industrial waste disposal sites. Examples of related section in NEQA 1992 are shown below.

- **Section 78** The collection, transport, and other arrangements for the treatment and disposal of garbage and other solid wastes; the prevention and control of pollution from mining both on land and in the sea; the prevention and control of pollution from the exploration and drilling for oil, natural gas, and all kinds of hydrocarbon both on land in the sea; and the prevention and control of pollution resulting or originating from the discharge of oil and the dumping of wastes and other matters from sea-going vessels, tankers, and other types of vessel, shall be in accordance with the governing laws related thereto.
- **Section 79** In case there is no specific law applicable thereto, the Minister shall, with the advice of the Pollution Control Committee, have the power to issue ministerial regulations specifying the types and categories of hazardous wastes generated from the production and usage of chemicals or hazardous substances in the production process of industry, agriculture, sanitation and other activities which shall be brought under control. For this purpose, rules, regulations, measures and methods must also be prescribed for the control of collection, storage, safety measures, transportation, import into the Kingdom, export out of the Kingdom, and

for proper and technically sound management, treatment and disposal of such hazardous wastes.

Numbers of ministerial regulations were issued or revised in accordance to the revision of the NEQA, 1992. Following are the selected ministerial regulations related to the management of solid waste.

- Ministerial Regulation: # 9 (1998) Issued in the Royal Gazette Dated 25 December 1998.

This regulation controls the registration of a private organization, who wishes to engage in environmental activities in Thailand, with the direct objectives in protecting the environment and conserving natural resources.

- Notification of the Ministry of Science, Technology and Environment, Issued under the NEQA, and published in the Royal Gazette Dated 7 August, 1997.

This Notification sets standards of effluent of waste incinerator. Under this notification: the waste incinerator shall be divided into two sizes:

- With the capacity rate of waste incineration: from 1 ton per day, but not more than 50 tons per day.
 - With the capacity rate of waste incineration: more than 50 tons per day.
- Notification of the Ministry of Science, Technology and Environment #3, Issued under the NEQA, and Published in the Royal Gazette Dated 13 February, 1996.

This Notification sets industrial effluence standards controlled by the Pollution Control Committee (PCC).

- Notification of the Ministry of Science, Technology and Environment, Re: Specifying Conditions, Procedures and Guidelines for Preparing Reports on Environmental Impact Assessment

This Notification governs the conditions, procedures, and guidelines for preparing reports on Environmental Impact Assessment. Any central waste treatment plant (as described in the Factory Act) is governed by this Notification.

It specifies that, if the waste treatment project is not required to be approved by the Thai Cabinet, the EIA reports can be submitted during the application for the establishment or the expansion of the factory. On the other hand, if the waste treatment project is required to obtain prior approval from the Thai Cabinet, the EIA reports must be submitted prior to the filing of the request for the Thai Cabinet's approval.

(D) Laws and Regulations Related in SWM

(C.1) Public Health Act (PHA), 1992.

This is the most comprehensive laws dealing with solid waste management. The PHA specifies that local government must provide disposal facilities for infectious and industrial non-hazardous waste and that health-care facilities can treat and dispose of infectious waste with approval from the local government. It emphasizes the roles of the municipality in solid waste management described in NEQA. The PHA Act designates sewage and solid waste management the responsibility of local authority. Therefore, waste management in Bangkok area will be under the responsibility of Bangkok Metropolitan Administration (BMA). As a consequent, BMA has the authority in licensing private solid waste operators to work on its behalf. BMA also has the authority to prescribe any rules, procedure, and conditions governing the waste management in Bangkok area.

(C.2) Public Cleanliness and Orderliness Act (PCOA), 1992.

The main content of this act is to forbid any activity that is likely to cause dirtiness to streets and public places all over the country. It specifies how households should store solid waste and place it for collection. The act is one of several that prohibit dumping of solid waste and littering.

(C.3) Factory Act, 1992.

The Act mainly controls and regulates the establishment and the operation of factories in Thailand by paying attention to the impacts of factory to the environment. Generally, factories are required to be kept clean and free from garbage and refuse at all time. Authorizes the Department of Industrial Works (DIW) to issue standards and specify methods for the control, handling, and disposal of waste by a factory and to license, permit, and inspect factory operations, including waste management. It also governs the licensing, permitting, and inspection of waste treatment, disposal, and recycling facilities. Also, according to Section 8 in the Act, PCD has authority to establish standards and criteria to control the factory operations, specially the standards and methods to control the disposal of waste, pollution or any contaminants caused from factory operation that impact the environment.

(C.4) Hazardous Substance Act, 1992

The act governs a broad range of hazardous materials, including hazardous and infectious waste. It also allows the handling, storage, transport, and disposal of hazardous waste to be specified in a ministerial decree. The act describes hazardous substance control criteria for import, production, transportation, consumption, disposal and export not to influence and danger to human, animals, plants, properties or environment. Ministry of Industry (MOIND) categorizes the hazardous substances into 4 types for use to control correctly and appropriately and formulates Hazardous Substances Information Center to coordinate with other government agencies in part of hazardous

substances information and stipulation of the criteria and methods to register hazardous substances.

(C.5) Industrial Estate Act, 1979

The Act oversees the powers of the Industrial Estate Authority of Thailand, including enforcement of regulations and taking action on hazardous waste practices within industrial estates.

(C.6) Construction Building Control Act, 1979

There is the Construction Building Control Act of 1979, which controls the design, construction, renovation, remove and utilization of the building. The construction of waste treatment plant shall be considered as the construction of the building under this Act.

(D) Code of Penalty

There are some Sections in the Penal Code of Thailand, which relates to the management of waste and refuse: those are as follows:

- Under Section 237 of the Penal Code of Thailand, it states that whoever introduces a poisonous substance or any other substance likely to cause injury to health into food or water in any well, pond or reservoir, and such food or water has existed or has been provided for public consumption, shall be punished with imprisonment of six months to ten years and fine of one thousand to twenty thousand Baht.
- Under Section 238, it states that if the offences committed according to Sections 226 to 237 causes death to the other person, the offender shall be punished with imprisonment for life or imprisonment for five to twenty years and fine of ten thousand to forty thousand Bath. If it causes grievous bodily harm to another person, the offender

shall be punished with imprisonment of one to ten years and fine of two thousand to twenty thousand Baht.

- Under Section 239, it states that if the offences mentioned in Sections 226 to 237 be committed by negligence results in imminent danger to the life of the other person, the offender shall be punished with imprisonment not exceeding one year or fine not exceeding two thousand Baht, or both.

1.2.2 Provincial Level

All national level Laws, Regulations, Ordinances and Guidelines relevant to SWM are applicable at provincial level.

1.2.3 Local Level

All National level Laws, Regulations, Ordinances and Guidelines relevant to SWM are applicable at provincial level. However, as BMA has the authority to grant license to private solid waste operators and in creating local by-laws that govern SWM, BMA has issued numbers of Ordinances relevant to SWM. Selected BMA Ordinances are as follows.

(A) BMA Ordinance: Disposal of Garbage, Refuse and Unclean Thing (1978)

Under this Ordinance: *Garbage* means waste from paper, cloth, food, merchandise, ash, animal droppings or carcasses, including things swept from streets, market places, animal stalls, or other places. *Refuse* means excrement or urine and shall include anything which is unclean and has foul odor. Articles of this Ordinance are as follows:

- Article 5: The person who is in possession of a premises, building, or dwelling place is required to provide garbage containers and use them to contain garbage within the premises, building or dwelling place possessed by him.
- Article 8: No person shall discharge, dump, discard or create refuse or unclean things in public places or ways such as street, passage, lane, river, canal, ditch, pond, or well, except at the places the setting up of which is permitted by the Public Health Official or the Local Official, or is specially provided.
- Article 14 : No person other than the officials of BMA shall haul, scavenge, or dig garbage in garbage container, garbage hauling automobile or vessel, or at any garbage-dumping site of the BMA.

(B) BMA Ordinance: Control of Water Sewage System (1991)

This Ordinance controls the water sewage systems in general types of buildings.

(C) BMA Ordinance: Specifying Requirements for Construction of Building and Public Utilities (1996)

This Ordinance controls the construction of building and public utilities systems in Bangkok.

(D) BMA Ordinance: Control of Waste Collection, Haulage, or Elimination Business which is made for Consideration as Service Fee (1998)

This Ordinance controls the waste collection, haulage, or elimination business, which is engaged by a private sector that provides the said waste collecting, hauling or eliminating service in consideration of service fees. It requires that any person, who wishes to provide the said services, must firstly obtain a license from BMA. The licensee shall enter into the agreements with BMA in accordance with the standard agreements drafted by BMA. It also states the obligations and responsibilities of the licensee.

1.3 Technical Guidelines

In addition to the laws and regulations, there are also technical guidelines prepared by relevant agencies covering several managerial aspects of various types of waste. Some are described as follow;

- PCD's Guideline for solid waste management
- BMA's Technical Guideline for Solid Waste Operator
- BMA's Guideline and Procedures for service fee collection.
- Guide to the Implementation of the Notification of Ministry of Industry on Hazardous Waste Manifest System Notification B.E. 2547 (2004)
- Guidelines for Waste Management in Hospital

1.5 Gap Analysis for Regulatory Framework

Existing laws lack regulation to cover entire system of solid waste management. The effectiveness of municipal solid waste management is also overlooked. Although the nation policy has emphasized on integrate waste management, clear measures to promote waste reduction and public participation in such initiatives were not mentioned. Apart from special color of waste bin assigned, measures to promote separation of household hazardous waste from conventional household waste do not exist. Despite the guideline for waste management for hospital, the infectious waste from hospitals is not properly controlled.

In order to overcome stated problems, the following measures can be employed.

- Establishment of laws, regulations, orders, and standards that create mechanisms for returning used products and packaging for recycling, and reduction of solid waste from household.

- Amend laws and regulations to increase private sector's role in solid and hazardous waste management in place of BMA.
- Amendment of existing laws, regulations related to service fee to promote polluter pay principle.
- Put emphasis on on law enforcement in order to make various steps of waste management more effective.
- Employ economic incentives program; incentives can be in forms of tax reduction for recycle and reuse of waste, reduction in service fee for household and private sectors. Appropriate incentive program can reduce quantity of waste at source effectively. Possible incentive programs are such as the incentives to reduce packaging wastes both in the production process and in the business sectors.
- Establish solid waste disposal site pollution control standard and other standard requires for effective solid waste management.
- Issuing standard procedures and technical guidelines on garbage collection service, management of waste disposal sites and other related issues.
- Clarify overlapping administrative jurisdiction within and between different levels government agencies. Lack of coordination amongst agencies can be seen as major obstacles in waste management.
- Inadequacy in public participation and unclear measures to facilitate higher involvement of public bodies in solid waste management issues.