

# WASTE MANAGEMENT FOR SUSTAINABLE ENVIRONMENTAL IMPACT REDUCTION IN LARGE CONSTRUCTION PROJECTS IN BANGKOK

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## **Introduction**

### **Statement and Significance of the Problem**

Garbage is one of the major causes of environmental problems affecting health. by construction waste of construction materials such as stones, concrete, bricks, wood chips, tiles, etc. Affect environmental problems resulting in loss of management costs. Currently, the growth of the construction business in Thailand is growing steadily. From small to large buildings, especially the construction of residential buildings ( Condominium ) , office buildings . Hotels and large shopping centers are continually emerging in these buildings. from the expansion of the construction of these buildings the result is A lot of construction materials are used, resulting in waste from the construction process. And most of the construction waste is solid waste that is difficult to manage and dispose of. resulting in various pollution that will affect the environment such as the amount of scrap materials used in the construction, the dust that will be increasing continuously, for the solid waste in Bangkok. If the waste at the source cannot be reduced, the problem of overflowing and residual waste in the year 2022 with the amount of waste 10,706 tons per day Although BMA aims to build 4 waste power plants , but can only dispose of 4,000 tons per day, Bangkok continues to face overflowing waste in the city.

Industrial business growth Construction affects the environment both directly and indirectly, especially Waste pollution problems in construction work which is illegally dumping construction materials on average. Approximately 300 tons per day, which is 0.5 percent of the total amount of waste. The proportion of material waste used in architecture representing 20 percent of the total amount of scrap material generated in the project, hence the management awareness. Problems of construction scraps to be more efficient and effective to optimize handling of scrap problems. Construction materials (Chokdee Yiphræ , 2011) waste from construction Most of them are caused by scrap materials or products left over from use in construction such as A piece of material left over from cutting broken material. packaging of materials used during construction and other waste arising from construction activities while demolition waste refers to Scraps from the demolition of buildings and structures in most cases, the scrap materials resulting from the demolition are mixed in various types, including concrete fragments, steel, brick materials. wood and other materials Including hazardous substances such as asbestos, mercury-contaminated materials, bitumen. In addition, construction and demolition wastes also include scraps generated during road construction and demolition. Consists of rock, gravel, sand, asphalt, and bitumen. And the dumping of these garbage is usually a combined dump. Either way, some of the waste is polluting. Currently, unknown amounts of construction scrap in Thailand are not dealt with. Correctly, some entrepreneurs do not pay attention to waste management as they should, secretly Bring those scraps to the empty areas, in the swamps, in the forest, etc., which affects the environment. directly and there is no agency responsible for controlling and inspecting waste disposal seriously for waste problems from construction and demolition in Thailand. It's not just the illegal dumping of the waste only. The problem is from the destruction of natural resources to

be used as raw materials to produce construction materials and demolition. Most of the materials used in construction are caused by blasting or excavating rocks, causing many environmental impacts. air pollution from dust, combustion, noise, and vibration from quarrying, quarrying and transport; Effects on scenery and landscape Although construction materials can be recycled efficiently. without destroying natural resources unnecessarily and causing another important problem One is the problem of contaminants contained in construction and demolition waste that are harmful to humans and living things. The main hazardous substance is asbestos, which is used as a component of products in various industries from the past to the present The products that Thai people have used most of them are Corrugated roof tiles, drainage pipes, ceilings, heat insulation They are all products used in construction. Because asbestos has acid-resistant, heat-resistant, fire-resistant properties with hard and tough fibers. Good flexibility. When used as an ingredient in such products, it will make it strong and durable. However, although asbestos contributes to improving the properties of various products, it has a significant disadvantage, especially the impact on the environment . body If asbestos dust and aerosols are inhaled into the body Until accumulating in large amounts for 15 to 30 years, it will cause lung diseases such as lung cancer pleural cancer and peritonitis, which such problems in many countries have given importance and strictly reduced the use of asbestos-containing construction materials. including having specific asbestos management measures to prevent and treat the effects of asbestos -related problems in addition to the problem of asbestos Construction and demolition waste may also contain other types of contaminants such as crude oil stains and mercury, which construction waste is not considered a hazardous waste. separate management but the contaminants caused by such waste If it is contaminated with general waste Those contaminants can cause harm later. Although Thailand is aware of such problems and effects. However, construction waste management in Thailand currently has no systematic management measures. Whether it is a policy, law, or related agencies. In addition, there is no clear promotion of reusing construction waste. related laws in particular, the Enhancement and Conservation of the National Environmental Quality Act of 1992 is a legal tool used to effectively control the environmental impact of waste. However, this Act does not aim to control construction waste. And there is no set waste from construction. Separated into specific types are only a part of municipal waste. Even though such waste should have a different management method than other types of waste. Because the components are diverse, difficult to decompose, and a large waste that is difficult to incinerate or landfill. It needs to be managed systematically before discarding. can reduce many problems Reduce illegal dumping Reduce the problem of acquiring landfill space even more if it is reused for cost-effective benefits. It will reduce the amount of this type of waste from the source, which will reduce the impact on the environment and use resources cost-effectively and sustainably.

When studying patterns from abroad found that the United States Environmental Protection Agency (United States Environmental Protection) or USEPA) , an agency responsible for public health and protecting the environment, has developed a concept of reducing the amount of waste at the source (Source Reduction) which is more efficient than the use of waste again ( Recycle) . can reduce the impact on the environment more than waste management later (USEPA, 1988). construct This made the researcher interested in reusing construction waste to reduce waste at source and solve waste problems sustainably.

### **Research Question**

1. Construction waste management problems of large construction projects What is it like in Bangkok?
2. Construction projects of large construction \_ in Bangkok What is the waste management process ?
3. What should be Waste management model for the sustainable environment of large construction projects in Bangkok?

### **Research Objective**

1. To study the problem of waste management from construction of large construction projects. in Bangkok
2. To study the process of waste management from large construction projects . in Bangkok
3. To present a model of waste management for the sustainable environment of large construction projects . in Bangkok

### **Research Hypothesis**

1. Good management which includes planning construction plan Planning the area before the start of the project. Preparing the place to place and store. Selection of materials that meet standards, work orders and control of work. will make waste management effective.
2. 3R management process will enable construction projects to reduce waste at source. Reduce project costs and ensure community safety. This will lead to sustainable waste management to reduce environmental impact.
3. Additional legal measures to manage Special construction and demolition waste to promote the recycling of construction waste for efficiency. and will reduce the amount of waste.

### **Scope of the Study**

This research is qualitative research. It will be a study of documents. to the waste management of large construction projects in Bangkok the researcher will explore and collect basic information on the management of construction projects. and specific interviews with construction project managers and 10 contractors in the project to acknowledge the concept waste management planning and coordinating with government agencies involved in waste management.

### **Significance of the study**

1. To study the problem of waste management from construction of large construction projects . in Bangkok
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### **Definition of term**

Waste management means a way to reduce the amount of construction waste through good planning. Collecting, transporting Efficient waste separation and disposal.

Construction waste means leftovers or things resulting from the construction or destruction of structures such as Scrap iron, limestone, concrete, fiberglass, PVC pipe, hard - to-destroy materials, mostly solids that do not decay. or takes a very long time, a hundred years or more.

waste management process It means waste management starting from planning work, construction, planning the construction site before starting the project, preparing the appropriate storage location, and storing materials, selecting materials that meet standards, studying drawings. before starting work clear order Closely supervise the work Waste sorting or type of waste Transport and disposal and reuse Efficient processing

Sustainable environment means 1 ) Reducing waste from construction sites (Reduce), including planning the construction work before starting work, modifying materials used to suit the job and improvement construction process for the reduction of waste or scrap materials 2 ) Reuse and Recycle of material or Recovery of material 3 ) Conversion to usable products (conversion products) and energy recovery 4 ) Dispose of unusable waste in a safe way .

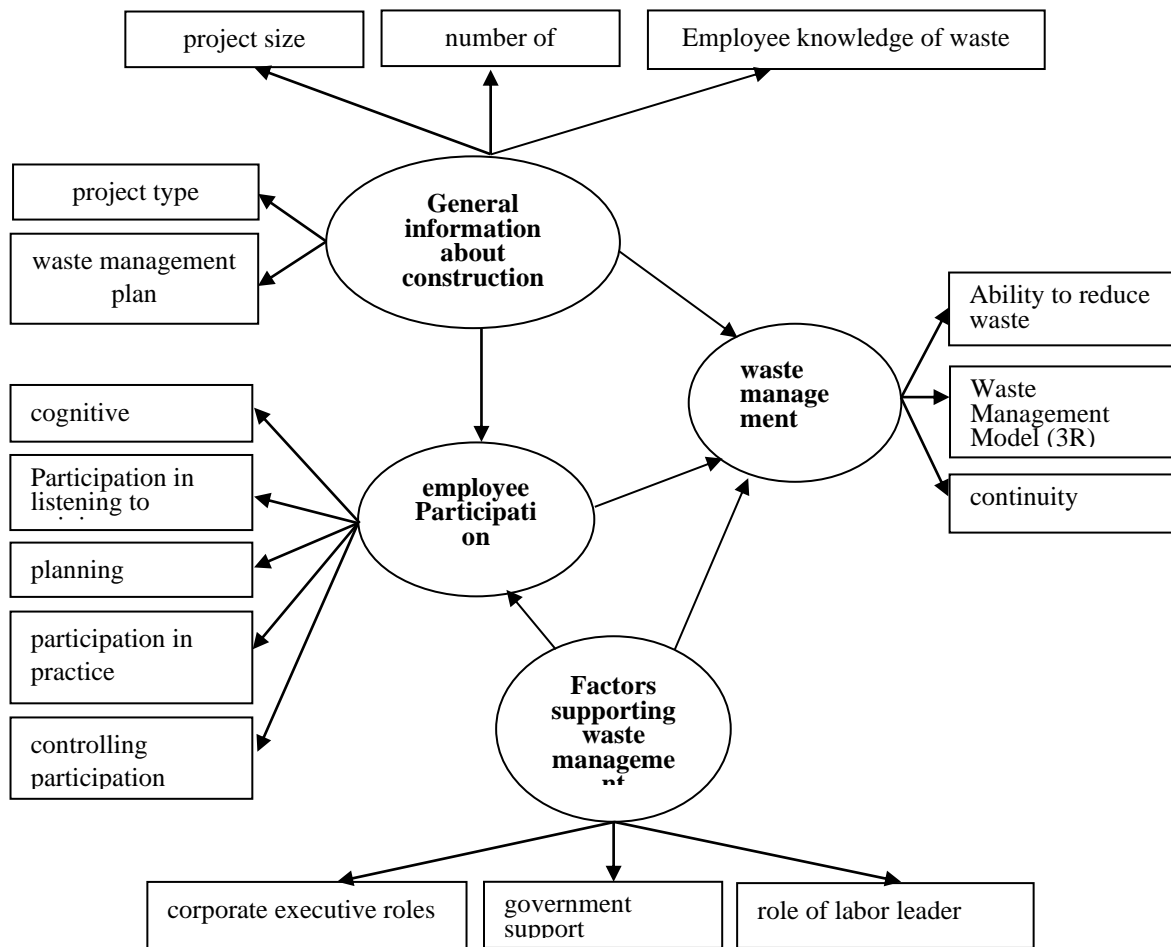
### **Review of Related Literature and Study.**

conceptual framework for research Economic growth and construction play an important role in increasing waste from construction and another problem of society Because construction waste is a material that is difficult to destroy . must use a different method of disposal from general waste, often using a landfill method, but there is a problem of in addition, moving is another problem because the waste generated requires a budget for moving . and properly disposed of according to the type of waste. Therefore, the waste management approach is to prevent the occurrence of waste or reduce the amount of waste by trying to adhere to the concept of 5R (Reduce, Reuse , Repair, Reject and Recycle) and from the study of theoretical concepts, it was found that the factors that most affected construction waste is project management Therefore , the management of construction waste must have a pattern and conceptual framework . On the matter of management methods to focus on reducing the amount of waste that may result in the cost of construction and to ensure safety within the construction project by studying waste management problems from Construction of factors that cause waste and proper planning according to principles of good management . To solve the problem of construction waste, a step - by - step management plan must be planned as well as Developing employees to be aware of problems and create a sense of concern for the environment and must \_ Focusing on human development first through the process of Environmental awareness for employees to have knowledge and understanding of the relationship between people and the environment. and work together to solve problems by using the concept of environmental management. waste management concept and management concepts

### **Theoretical Concept and Review of Related Literature and Study**

1. Participation Theory
2. The concept of perception theory
3. The concept of management theory
4. Human Resource Theory
5. Theoretical concepts on public policy
6. The concept of leadership theory
7. Theoretical concepts of environmental management
8. Concepts related to solid waste management
9. Situation and management of solid waste in the country
10. The 13th National Economic and Social Development Plan (2023-2027)
11. Environmental Quality Management Plan 2023-2027
12. Clean Province Action Plan 2023, Ministry of Interior
13. Solid waste problem situation and solid waste management problem
14. Related research
15. Conceptual framework for research

## Conceptual Framework



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