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CHALLENGES OF THE DEMOLITION WASTE MANAGEMENT PRACTICE AT SELANGOR

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ABSTRACT

Construction waste has increased as the industry has expanded. Selangor has a wide-ranging impact on the environment, finances, production, timeliness, society, and economy. Many duties are required for construction and demolition projects, some of which may have an impact on local ecological and community health if not managed properly. This paper is done to investigate demolition management in Selangor. Respondents are engineers, building control and waste management. According to the findings, the most serious issue with construction and demolition waste in Malaysian construction industries is illegal dumping Reusing a small amount of waste, such as broken bricks, as a subgrade for a construction site access road is the next best option because the waste produced cannot be avoided.

Keywords: *demolition waste, challenges managing waste, solution*

INTRODUCTION

In most developing countries, rapid urbanisation, and industrialisation, combined with ever increasing population growth, has resulted in a surge in solid waste. Wastes produced by a variety of human activities, both industrial and household, can pose health risks and have a negative influence on the environment (Eusuf, 2012). Demolition wastes are heterogeneous mixes of construction materials such as aggregate, concrete, wood, paper, metal, insulation, and glass that are typically polluted with paints, fasteners, adhesives, wall coverings, insulation, and dirt. These wastes are produced because of the full or selective removal or demolishing of existing structures, either through man-made processes or natural disasters such as earthquakes, floods, and hurricanes, as well as trash generated during renovation and remodelling projects (El-Haggar, 2007).

Malaysia has been seen as a quickly developing country in recent years. In comparison to our expectations, the country's development is moving at a breakneck pace. As a result, many demolition projects are required to demolish old structures to make way for new construction. Demolition waste is two time as much as construction waste. As a result, excessive demolition projects in a developing country will result in excessive demolition waste, which will have a far greater impact than construction waste. For example, concrete waste accounts for a significant port ion of the entire amount of demolition waste, accounting for 24 percent, according to previous studies. As a result, there are major concrete waste problems, and demolition concrete waste recycling is still a problem. Every year, 50-60 million tonnes of demolition concrete are produced in European countries and the United States. Only a little amount of demolition concrete being recycled in the country now (Wong & Roslan, 2019). Construction and demolition waste is a significant global issue with severe implications for project performance, society, and the environment. Waste can take many different forms. In view of the increased acceptance of sustainable development, effective construction and demolition waste management should be emphasised.

LITERATURE REVIEW

The term "demolition work" refers to any activity that involves the destruction or dismantlement of a structure or any part thereof. It does not include the dismantling of poles used for the transmission of electricity, light, or telecommunications, nor does it include the dismantling of formwork, falsework, scaffolding, or other structures constructed or utilised to support access or confinement while building is being done. According to the definition, a structure is anything that has been built, including buildings, sheds, towers, chimney stacks, silos, and storage tanks. Structures can be fixed or mobile, temporary, or permanent, and fall under any of these categories. (Demolition work Code of Practice, 2021). The process of demolition typically

involves several stages, including planning, obtaining necessary permits, utility disconnection, salvaging reusable materials, and the actual demolition using methods such as implosion, high-reach excavators, wrecking balls, or handheld tools. It is important to note that demolition work requires careful consideration of safety measures, environmental regulations, and proper waste management to minimize hazards and negative impacts on surrounding areas. Professional demolition contractors are often hired to carry out such work, ensuring compliance with regulations and employing specialized techniques to mitigate risks (Demolition work Code of Practice, 2021).

Demolition Work Process and Procedures

It is necessary to devise an appropriate demolition procedure to carry out effective work planning. As a result, all individuals and professionals involved in demolition work must have a thorough understanding of the process and procedures involved in demolition. The process of demolishing something entails doing everything from start to finish.

Before any demolition work can begin, all parties involved must conduct a thorough evaluation of all relevant factors. Demolition procedures can include a variety of standard and custom steps, depending on the nature of the job. A thorough site survey is required before any demolition work can begin. The two most common types of surveying are building surveying and structural surveying. (Rathi, 2014). The purpose of the building survey is to evaluate various aspects of a building, such as its materials, its usage, the method of its construction, its condition, drainage conditions, traffic conditions, building codes, and surrounding communities. The structural system of basements, underground tanks, or underground vaults, as well as the structural state of these structures, are the focus of the structural survey process. The structural system used during the preliminary design phase, as well as the current structural state of the building.

To ensure the safety of the demolition process, a structural stability report was required, which included the structural integrity of adjacent buildings and properties, as well as the stability of the building to be demolished at all stages of demolition (Rathi, 2014).

Challenges of Demolition Waste Management

- Disposal of construction and demolition waste in large quantities

To maintain a pollution-free environment, it is crucial to work toward the creation of a more effective policy for handling demolition waste because wastes from construction and demolition make up a sizable portion of municipal waste. As a direct result of this, the Malaysian government established the CIDB with the goal of restructuring the industry to enhance its environmental performance. To educate key players in the construction industry about the value of sustainability, CIDB has created a Construction Industry Master Plan. (Sin et al., 2013).

- Unlawful dumping location

According to a Malaysian government assessment, 39.3 percent of construction waste was discovered in the Hulu Selangor District, out of a total of 87 unlawful dumping locations. However, private enterprises mostly focus on domestic garbage while ignoring or paying little attention to construction waste. Furthermore, to supervise contractors' work and activity, CIDB and Solid Waste Management and Public Cleansing Corporation intend to establish a guideline on construction waste management in the future. This demonstrates the Malaysian government's dedication in dealing with waste, which is currently fighting to tackle the problem. Because people are not aware of the problems and don't know much about them, the construction industry in Malaysia is changing slowly toward sustainability (Wong & Roslan, 2019).

- Illegal Contractor and workers

An illegal contractor is a person or company that performs construction or contracting work without the necessary licences, permits, or legal authorization. They operate outside the law and do not follow the regulations, requirements, and standards established by local authorities, building codes, or industry practises. They may use inferior materials, perform substandard construction, disregard safety protocols, and violate labour laws. Working with an illegal contractor can result in financial losses, legal issues, compromised structural integrity, and potential harm to workers or occupants. In May 2011, Malaysia has approximately 1.9 million foreign workers spread across sectors such as manufacturing (39%), construction (19%), plantation (14%), housemaids (12%), services (10%), with the rest in agriculture. The contributing countries by rank are: Indonesia (50.9%), Bangladesh (17.4%), Nepal (9.7%), Myanmar (7.8%), India (6.3%), and the rest of Vietnam. Home Minister Datuk Seri Hishammuddin Hussein had announced that the government plans to reduce the number of foreign workers to 1.5 million in

three years. If we were to account for another 2 million illegal foreign workers, the number is explosive considering Malaysia such a small job market (Kanapathy, 2006).

Besides that, there are contractors that are not registered in their field. This is the wrong side of the invitation. Registration is important for individuals and seeking construction services or contracts to verify the legitimacy and legality of the contractor before signing any agreement. This includes verifying their licenses, certifications, insurance care, and reputation through appropriate channels such as a local license board, consumer protection agency, or professional association.

- High Cost on transportation (Local Authority)

Transportation for waste collection is the process of collecting and transporting waste materials from residential, commercial, and industrial areas to designated waste management facilities in a local authority. Effective waste transportation systems are critical for a local authority's cleanliness, public health, and environmental sustainability. Here are some important aspects of waste collection transportation.

Strategies for Improving Current Demolition Waste Management Practice

- Public Awareness and Education

It is critical to raise public awareness about the negative consequences of illegal dumping and to promote responsible waste disposal practises. Local governments can use various channels, such as community events, social media, signage, and public service announcements, to educate residents about proper waste disposal methods and the legal ramifications of illegal dumping.

- Enhanced Enforcement and Penalties

Improving enforcement efforts by allocating adequate resources to monitor and investigate illegal dumping incidents can serve as a deterrent. Local governments can collaborate with law enforcement to identify and prosecute offenders. Stricter penalties, such as fines, community service, or even imprisonment, can act as a deterrent and emphasise the gravity of the offence.

- Provide Training or Resources

If you notice a contractor who is otherwise competent but lacks knowledge in waste management, you can provide them with resources or training materials to help them understand. Give them guidelines, manuals, or online resources on proper waste management practises in the construction industry. Local authority can also suggest relevant training programmes focusing on waste management.

- Finance

Finance is one of the factors that influence decisions in practicing continuity in waste management. The parties involved require the cost to pay the contractor citing the construction waste at the site to the landfill. So, all respondents agreed to reuse a small amount of waste such as broken bricks, as a subclass for construction site access roads. In addition to reuse, it can save money to buy stone or sub grade for road access on the construction site. In addition, it can also reduce transportation costs to throw concrete debris to landfill.

- Reducing waste

The most environmentally effective method to reduce waste at landfills should start with reducing waste. Therefore, the parties involved need to use a method of reuse, recycling to reduce waste in landfills. They need to be aware of the importance of technology to reduce waste in the construction industry in Selangor. According to results, it shows that all the interviewees agree and give their opinion to use this technology.

RESEARCH METHODOLOGY

Quantitative research involves collection of numerical data to understand a specific situation. The quantitative method that used in this research is the archival data in numerical based data collected through case study method from the target respondent. As mentioned before, this study will cover the demolition waste management practice in Selangor. Questionnaire distributed to the Building Control, Engineering and Waste department in Local Authority.

Method of Data Collection

Data collection occurs when process of collecting data starts. There are many mediums can use to collect data such as interview, questionnaire, and literature review. Validity of data is the prime concern in this study as it will determine the quality of the data. There are two types of data which classified as a primary data and

secondary data. Primary data is the most important data in this study where actual phenomenon will be on census the secondary data which collected from the literature review.

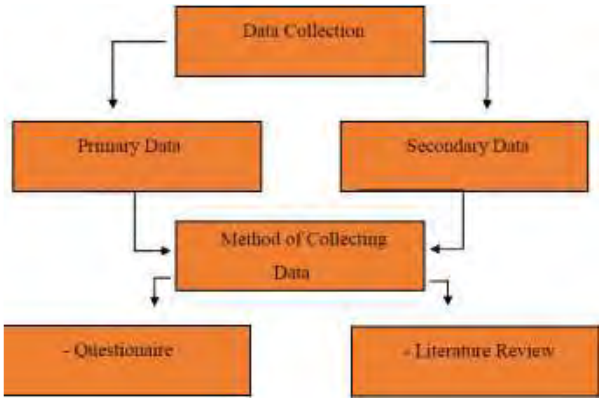

Figure 1: Method of Data Collection

As mentioned before, this study will cover the demolition waste management practice in Selangor. Questionnaire distributed to the Building Control, Engineering and Waste department in Local Authority.

RESULTS AND DISCUSSION

Table 1: Challenges in Managing Demolition Waste

Items	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean	Index
Disposal of construction and demolition waste management in large quantities	0	0	0	15	35	4.7	High
Unlawful dumping location	0	0	0	10	40	4.8	High
Contractor don't have knowledge CDW	0	0	3	5	42	4.78	High
Illegal Contractor/worker	0	0	3	8	39	4.72	High
High cost transportation of Local Authority	0	0	2	15	33	4.62	High

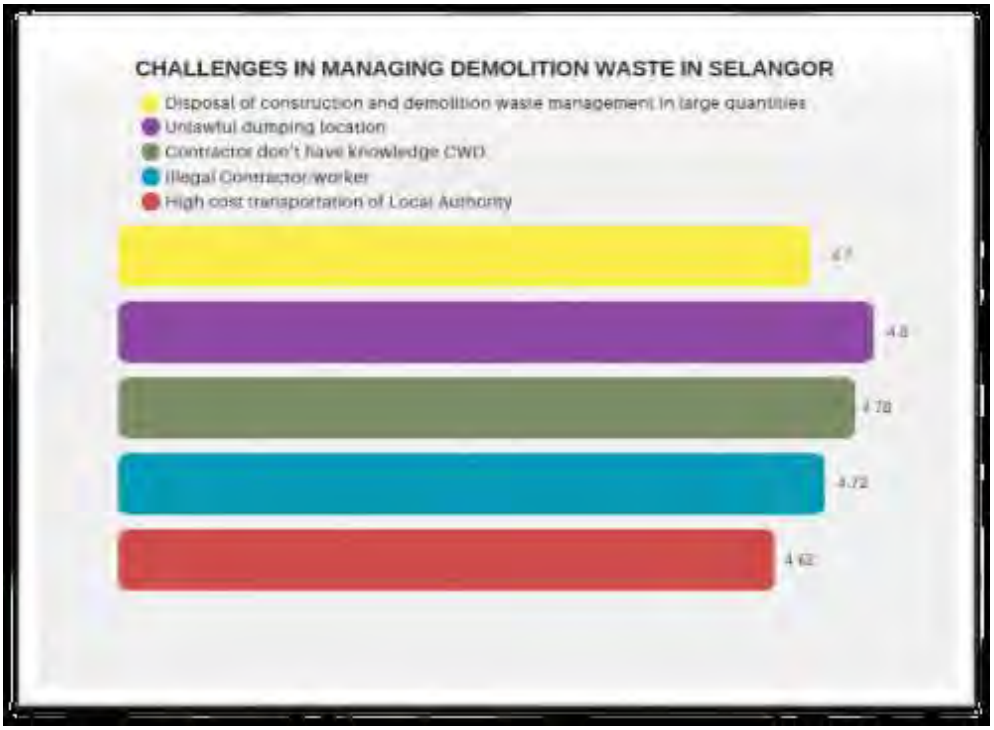

Figure 2: Challenges in Managing Demolition Waste

Table 2: Rank of Challenges in Managing Demolition Waste

No	Items	Mean	Index
1	Unlawful dumping location	4.8	High
2	Contractor don't have knowledge CWD	4.78	High
3	Disposal of construction and demolition waste management in large quantities	4.7	High
4	Illegal Contractor/worker	4.72	High
5	High cost transportation of Local Authority	4.62	High

From the analysed data collected from 50 respondents on each Likert scale questions, there are all the challenges in implementing demolition waste management rated as high. This is based on respondent answer of the questionnaires. But the highest number of means are found at the number (ii) which is the unlawful dumping with the statistical mean of 4.8. Most of them are agree to the statement, which is 40 strongly agree number of respondents, followed by 10 of them are agree. None of the neutral, disagree and strongly agree to the statement.

This is because the respondents faced these challenges in managing waste in Selangor. Thus, this is the current issues that the person in charge faced. Then, the second highest rated challenges in managing demolition waste are contractor do not have knowledge CWD. The highest selected answer is strongly agreed which is 42 of them and followed by agree 5, and 3 neutral. None of the disagree and strongly agree to the statement. This is because the respondents felt lack of knowledge from contractor can be the challenges for managing demolition waste in Selangor. Illegal contractor or worker (iv) with the mean 4.72, respondents are high on this question. Majority of them rated strongly agree as their answer which 39 of them, followed by 8 of them on the agree rate, 3 number of them are neutral. None of them is disagree and strongly disagree with this statement. This means that, there are many contractors that are not registered in their field recorded in Local Authority. This is the wrong side of the invitation. Registration is important for individuals.

Disposal of construction and demolition waste management in large quantities (i) is high. From the data collected the highest rated scale are strongly agree to the statement with 35 out of 50 respondents. Second is agree with 15 of them and none disagree and strongly agree for this statement. Approximately 95–97 percent of solid wastes, including construction and demolition waste, collected in Peninsular Malaysia are dumped at the disposal sites, while the remaining 3–5 percent are treated either by employing a technique involving incineration or are recycled and reprocessed.

Finally, high-cost transportation of Local Authority (v) is ranked high based on the statistical mean of 4.62. Most of the respondent’s rates on the scale with strongly agree 33 numbers of them, followed by 15 of them are agree to the statement and 2 of them are neutral on it. Effective waste transportation systems are critical for a local authority's cleanliness, public health, and environmental sustainability. It is important for local authority to make sure waste collected on time.

CONCLUSION

As a conclusion, based on the findings from the questionnaires collected from the respondents. After analysed using statistical mean, all the challenges stated in the questionnaire are all in the high index which mean, respondents have big deal to implement waste management practices in Selangor. Back to the root, there are

many challenges faced by the local authorities such as illegal contractor or worker and unlawful dumping. The contractors' obstinacy in illegally dumping construction and demolition waste on the side of the road or on other people's land, despite constant monitoring and enforcement. Other challenges include the high cost of local government transportation. In some cases, local governments may collaborate with private waste management companies or contractors to provide waste transportation services. Contractual agreements defining service requirements, performance standards, and regulatory compliance are frequently used in these collaborations to ensure effective waste management within the local government.

RECOMMENDATION

Improper construction waste management can have a significant impact, and it should be addressed to ensure that construction waste is managed in a more sustainable manner. As all parties involved in waste management work together to achieve sustainable waste management. Some recommendations for improving a few aspects of local government's management of construction and demolition waste can be obtained, for example by using more advanced and efficient construction technologies to reduce construction and demolition waste, such as the use of Industrialized Building Systems (IBS) to reduce waste, by increasing the amount of construction and demolition waste that is reduced, recycled, and reused, and by improving workforce awareness and education about construction and demolition waste management for waste reduction. It will not only be able to improve current conditions in terms of economic, social, and environmental aspects, but it will also be able to reduce the issues of settling the steadily increasing solid wastes by having better technology in sustainable waste management.

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Setuju.

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