The Development of Waste Bank Model with Islamic Principles: A Literature Study

Review of Integrative Business & Economics Research

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ABSTRACT

Waste is an important issue related to the environment. The Central Bureau of Statistics (BPS) noted that in 2016, Indonesia's amount of waste reached 65 million tons per year produced by the 261 million population. This issue is also being experienced by Bandung, West Java. Every person in Bandung produces 0.6 kg of waste in a day. Thus, the total volume of waste is 1,500 tons per day. Therefore, waste management is a crucial problem that should be solved by involving all of the stakeholders. Even more, waste can provide various opportunities if it is appropriately managed. In Bandung, both the government and society are the actors that have participated in reducing household waste. Many efforts have been made to overcome this problem, particularly by adopting the concept of a circular economy. Waste Bank is a model of the Indonesian approach to initiate recycling industry and managing the waste. This study constructs the study literature to see whether implementing the Islamic waste bank concept is feasible in Indonesia. The study concludes that waste bank was effective in managing the household waste. The application of Islamic principle in this context is also relevant in Indonesia.

Keyword: Household waste management, waste bank, Islamic Principle, Circular Economy.

1. INTRODUCTION

Waste is a crucial issue in an environment whose poor management can affect socio-economic, health, and environmental problems. By 2016, the Central Bureau of

Statistics (BPS) recorded that the amount of waste in Indonesia reached 65 million tons per year, produced by 261 million. In addition, BPS predicted that it would be increased by 2.2 billion tons per year in 2025. This amount is resulted from the production of waste by 1.42 kilograms per person in a day. This issue is also being experienced by the City of Bandung, West Java. The residents of Bandung produce 0.6 kilograms of waste per person each day then accumulated about 1,500 tons per day. In 2020, the total production of waste reached 1.735,99 m3/day (BPS, 2021)

The volume of waste is estimated to increase as the world population and urban density sprawls. The speed of population growth leads to environmental problems such as the great use of natural resources, the increase in air pollution, and the volume of waste (Roy-Basu *et al.*, 2020; Sadrnia, Langarudi and Sani, 2020). Therefore, waste management is a crucial problem that should be solved by involving all the stakeholders. Bandung has implemented it, when both the government and society have participated in reducing household waste. Although still far from the target of the National Strategy Policy, Bandung achieves a better accomplishment than Indonesia's by reducing 4 percent of household waste.

The stakeholders have been making many efforts to solve this problem. Meanwhile, it should be noted that any solutions for waste management issues should be both integrated and sustainable (Behzad *et al.*, 2020). As the development of the waste management model, the circular economy concept exists by covering these two aspects. The circular economy talks about the added value of waste management for environmental sustainability and creates new economic added value and social change through community empowerment. Through the circular economy approach, the mindset of waste changes if it is appropriately managed. The waste that previously is dirty, smelly, source of diseases changes to the source of various opportunities.

The waste bank is one of the innovative models of waste management that involved a circular economy approach to solve the waste problem in Indonesia. Its characteristic of community-based attracts people to participate in managing the waste. Many interesting programs can be followed by all generations, including children, students, youth organizations (*karang taruna)*, and housewives. The economic, social, and educational factors play a role in attracting them. An increasing recycling rate is essential to minimize the disposal of residues in landfills, reduce emissions, and partially recover raw materials.

Practically, the residents use their household waste to change with some money that saved, cash or changed to other forms. In this study, we enhance the application of waste bank management by implementing the Islamic principal transactions. Integrating Islamic values in the community is expected accelerating the society's acceptance and participation of the waste bank management. As the largest Muslim population in the world, implementing the Islamic principle is expected will be attracting factor in the Islamic waste bank implementation in Indonesia.

This study constructs the study literature to see whether implementing the Islamic waste bank concept is visible to implement in Indonesia. Therefore, this paper contributes in two veins. First, we contribute to the empirical literature about this rare study, namely Islamic waste bank management. Second, in the practical aspect, we develop a new concept in solving the environmental problem. It also can be an appropriate recommendation about waste management to other cities in Indonesia.

2. WASTE MANAGEMENT

A well-functioning of waste management is a central element for a good quality of life. Brotosusilo et al., (2020) found that the level of household economic prosperity is positively correlated with behaviour in maintaining an environmental clean and healthy. However, due to the poor and inefficient waste management, there is an increased quantity of concerns regarding waste and its management in many cities and regions (Jacobsen *et al.*, 2018). BPS noted that waste bank rose more than five times from 2014 to 2018, as many as 1.172 units to 7.488 units.

In Indonesia, waste management is initially collected from households and deposited at a temporary collection point (TPS). The TPS is divided into several different area functions: first, TPS based on 3R (reduce, reuse, recycle); second, TPS with multi-compartments; third, TPS with the type-based schedule. These divisions are enacted before waste is sent to the final disposal centre (TPA). However, most of the collected waste is still mixed and unsorted because residents do not properly separating their waste (Arifatul *et al.*, 2020). The mixed waste leads to a huge amount of discarded waste in the TPA's landfill. Furthermore, it is a threat to Indonesia since the supply of appropriate landfills is difficult to find.

In addition, due to the characteristic of unsorted waste, these processes not adequately addressed the economic, social, and environmental aspects. It is often ignored that these three aspects gain the benefits and a catalyst for future improvement. The study of Zaman and Swapan (2016) that covers 168 countries in the world measure the materials recovered from waste management using Zero Waste Index (ZWI). The findings show that an average person could save around 216 kWh of energy by the appropriate waste management, 0.05 kg GHG and 36 L of processed water. Each person would then potentially save about $61.3 annually that arises from materials substitution and energy substitution. Regarding the social context, community-based waste management engages the community members to participate, resulting in sustainable interactions. It grew rapidly and has supported the community's income and encourage people's self-reliance in environmental management (Wijayanti and Suryani, 2015; Indrianti, 2016).

As previously mention above, the TPA's landfill is the threat caused by unsorted waste. To reduce the amount of collected waste in the TPA, Bandung city that concerns on waste management applied a *"Kang Pisman"* campaign to prevent waste production locally in Bandung. *"Kang"* means reducing. The community is encouraged to reduce disposable plastic then change it to the reusable shopping bag, bottle drink and lunchbox. *"Pis"* means classifying. The storage of waste was classified into three types. The first Type that consists of organic waste such as food and plant is stored in a closed place. The second type consists of an-organic waste such as papers, cans, glass and bottle plastic, and third type is other types of trashes like electronic waste. Therefore, *"Man"* means utilizing. These three types of waste are utilizing based on each type. The first type of waste is processed into bio pores, composter, biodigester, maggot BSF (Black Soldier Fly) for organic fertilizer or animal feed. The second type of waste can be processed into handcraft or given to scavengers or waste banks. Type 3 is the residual waste carried into the temporary collection point (TPS) then the final disposal center (TPA). In general, It is possible to minimize the amount of waste sent to landfills, recycling more material and enabling energy recovery is possible.

3. CRCULAR ECONOMY

Waste management has been evolving over the decades. The former focuses on the comprehensive coverage of the entire process from waste generation to disposal, whereas the latter examines various waste management scenarios (Behzad *et al.*, 2020). In addition, new waste concepts have been applied such as the circular economy approach that will be discussed in this study. The first termination of "Circular Economy" has been found in 1990 when attempting to simulate an economy using a materials balance model of thermodynamics. The three materials were identified as three economic functions of the environment: resource supply, waste assimilation, and utility. As a result, a circular economy model that defines the interaction between economics and the environment has been developed (Amir, 1994).

The circular economy concept refers to a set of interrelated regenerative operations, including reduce, reuse and recycle activities that aimed in reducing (or even eliminating) waste generation and implement secondary raw material recovery systems (Kirchherr, Reike and Hekkert, 2017). Practically, there is an extended cycle of discarded trash. Then it can be utilized for other beneficial things in life. The main aim of the circular economy is not only to maximize waste prevention but also to increase product recovery and minimize the environmental impacts of waste materials. Thus the economic prosperity, environmental quality and social impact can be reached and optimized to future generations throughout the lifecycles of materials, components and products (Velenturf and Purnell, 2021). In addition, it operates at the micro-level (products, companies, consumers), meso level (eco-industrial parks) and macro-level (city, region, nation) that generated sustainable development in the long term (Kirchherr, Reike and Hekkert, 2017; Xavier, Ottoni and Lepawsky, 2021).

A comprehensive approach in the circular economy framework includes a wide range of activities that are separated into two fronts: upstream and downstream. The upstream phases should encourage the rational habit of manufacturers to decrease waste quantities and limit the usage of hazardous components. The Extended Producer Responsibility is the driving force behind the circular economy. Under the EPR regulatory framework, a producer's obligation may be extended to the post-consumer phase of their products. This requires the producers to properly process and dispose of the end-of-life product. To put it another way, producers must accept responsibility for handling trash generated by their products (Lieder and Rashid, 2016)

Meanwhile, the downstream is related to returning the material to the productive chain through various stages. The approach should also show better reverse logistics and improved, more economical, eco-friendly, and worker-friendly to ensure that benefits are drawn fully and safely from the tremendous economic potential of the waste (Bakhiyi *et al.*, 2018). The waste hierarchy should be prioritized in both upstream and downstream operations in order of priority: avoidance, reduction, reuse, recycle, recovery, and adequate final disposal.

The circular economy replaces the open-loop principles to the closed-loop principle circular system. The open-loop circular, known as linear economy, is defined as take-make-use dispose paradigm. Meanwhile, in a closed-loop circular setup, the value of products, materials, and services are maintained in their active use as long as possible through the recycle, reduce, and reuse principle (Lieder and Rashid, 2016).

Through this approach, the final use of the product can be re-utilized to partially substitute the virgin material in our daily life.

4. WASTE BANK AS A HOUSEHOLD WASTE MANAGEMENT

The waste bank, categorized as an attempt at household waste management, becomes one of the Innovation of Urban Management (IMP) in waste management by involving private and public sectors. Waste bank is a place for sorting and collecting waste that can be recycled, reused and / or reused that has economic value. Initially, in 1997 the "garbage for egg" project was introduced in Bangkok, Thailand, and it was known as the first community-based recycling project (Singhirunnusorn, Donlakorn and Kaewhanin, 2012). In the following years, the solid waste recycling bank project was initiated as a new manner in 'saving waste.' The household waste is collected and sold to an informal collector. An organic waste is categorized based on its characteristics. Therefore, people gain some amount of money that can be saved and withdrawn regularly.

In Indonesia, waste bank management was firstly established in Bantul, Yogyakarta, in 2008. Therefore, it was followed by several cities in Indonesia (Wijayanti and Suryani, 2015). The environment ministry reports that around seven-thousands of waste banks with hundreds of thousands of customers already exist in Indonesia. Sekarningrum (2020) found that the consciousness and public participation of creating waste bank is the highest public awareness to solve the waste problem in the area compare to their practice of making biopori holes, processing organic waste into compost, recycling garbage, disposing residual waste in landfills.

To support waste bank in Indonesia, the Minister of Environment Regulation Life No. 13 of 2012 requires the producers to commit in reducing, reusing, and recycling through the waste bank. The business process of a waste bank is similar to a regular bank, but it is processed in the form of inorganic sorted waste. Therefore, a lot of potential customers predicted the velocity of money in thousands of waste banks reaches billions of rupiahs per year (Widaningsih and Suheri, 2021).

The most important factor in waste bank is public participation. The implementation of waste bank as community-based approach can be implemented through both rural and urban communities. (Wijayanti and Suryani, 2015) stated that waste bank as community-based waste management is more accepted in rural communities than urban communities due to two factors because of the following reasons. First, mostly rural residents are inhabited by lower-middle-class economy people. Note that, the economic value of waste bank as supplementary income can encourage the society to participate in waste bank management. Second, the characteristic of rural community still bond with tradition that engaged each other make easier to encourage the participation. Similar to Sariningsih et, al (2021) stated that the purpose of building a waste bank is a strategy to build public awareness so that they can familiar with waste to get economic benefit from waste. Through this approach, residents being disciplined in managing waste. They are also got additional income from the garbage they collect to the waste bank

However, the awareness of urban communities is increase right now. The zero-waste or less-waste lifestyle became a new spirit in the millennials and new married couples that are campaigned in various streams (Khairani, 2021). The well-educated

person, who was mostly characterized by urban communities, influences the human productivity and ability to make good choice. Individuals who have a good awareness of health might be encouraged to engage in preventative behaviours such as keeping the environment clean through responsible waste management. These choices are lacking for those with no or little knowledge of environmental cleanliness as the key to their health and wellbeing (Brotosusilo and Handayani, 2020)

The program at waste bank seeks have more innovative approach than regular waste management. Waste bank develops some unique programs such as sorting training, recycling training, handcraft training, and composting training that became a strategy in encouraging the society's participation in three aspects: educational, environmental, and economic aspects. In addition, the exchange system innovation such as paying electricity and water bills with waste saving integrated waste bank into system in order to promote systematic people-centered economy. At the end, through community participation, the waste bank concept can encourage household behaviour to reduce waste in hugely scope.

The waste bank not only benefits the community economically, but it also reduces waste volume at the final disposal site. A reduction in waste tonnage has been reached up to 7,14 tons per week. The transported waste to landfill in 2005 above 1.800 m3. Then in 2011, this sum had been reduced below 1200 m3. It was proven that waste bank as a successful example of community-based waste management.

5. WASTE BANK MANAGEMENT BASED ON ISLAMIC PERSPECTIVE

Islam is a religion that provides a holistic guide to human beings in almost every aspect of life, including cleanliness and waste management. The guidance of Islamic principles regarding waste management can be observed from the various teachings of Islam. *First*, Imam al-Bukhari narrated that the Prophet mentioned: "*The cleanliness is a half of faith*". It means that about fifty percent of the person's religious responsibility is to care about cleanliness and maintain a hygienic lifestyle. The reward level is so substantial that it could reach a level in reward equal to half of that for having faith. Second, as reported by Imam Muslim in his authentic collection, the Prophet said that the lowest of seventy branches of faith is the removal of harm or waste materials from the road. It shows the importance of a hygienic lifestyle in maintaining environment (Wijayanti and Suryani, 2015).

Public participation is an important resource for waste management projects. People's participation in waste management improves when their awareness of household garbage grows, and vice versa. Public awareness of waste management, on the other hand, does not always translate into action or engagement. As a result, pre-social training is required to increase community involvement. Therefore Sekarningrum (2020) states that religious figures can play a major role in turning people's discursive consciousness into practical awareness (participation).

Every law in Islam is intended to meet the benefits for human life on earth and in the afterlife. This objective is known as *Maqashid Sharia*. Imam Ghazali stated that the concept of *Maqashid Sharia* protects the objectives of the Islamic law as the basic regulations in live to fulfil the usefulness of every action on human life. It also protects the people's stability of life from any threats and improves society's prosperity by

maintaining five aspects: religion, spirit, logic, descendants, and wealth (Gafur, Soetedjo and Triyuwono, 2015).

The concept of Islamic principle of waste bank was initially discuss by Mukhlis et al. (2018). He summarized the application of these five aspects of *Maqashid Sharia* in waste management, particularly the practice of waste bank in Malang (BSM), East Java. BSM is the waste bank that applied the Islamic rules in their activity. We also enhance our practical analysis in Bumi Inspirasi, the migrated waste bank into Islamic management system in Bandung City, West Java.

In the first aspect of *Maqashid Sharia*, namely preserving the religion. Business is viewed in Islam as a form of worshiping God Almighty, and the business aim of profit must be met using shariah-compliant methods. Furthermore, shariah demands legitimate (halal) transactions and forbids transactions including components of *riba* (interest) or speculation. Since *riba* is prohibited in Islamic law, therefore the BSM's Islamic waste bank solve this concern by avoiding the *riba*. As a replacement, the Islamic waste bank implements a profit loss sharing system that is agreed upon by both parties.

The second aspect was namely preserving the spirit. To carry out the law of life, people must have both physical and spiritual health. Therefore, the saving program at BSM protects people's lives through long-term savings and anticipates future unwanted events. In addition, to maintain the spiritual health, Bumi Inspirasi waste bank implements the Islamic value in their operations. For instance, Islamic studies that held periodically selecting partners that have the matching values, praying on time, stopping the whole activity at prayer times and developing a waste bank on Islamic values more broadly.

The third aspect, preserving logic means protecting things that can damage the logic or maintaining the ability to think. Therefore, the activity of the saving program at BSM indirectly safeguards the ability of the brain to think. The saving can utilize for school fees, buy books, and addressed the need of the school. Bumi Inspirasi waste bank also have a role in providing specific education on environment concerns through their missions. Among its missions are to develop education for mothers and children to become agent of change and "The Earth Protector Heroes", to improve the waste selection and the literacy about economic value of waste.

The application of the fourth aspect, preserving the descendants, is crucial to create good quality and *akhlaq al karimah's* future generation. The segment of the BSM program involves all society's elements, including children, adolescents, adults, housewives, and youth generations in protecting the environment. In particular, Bumi Inpirasi waste bank involved the young generation as their employee. Not only to act as officer in the waste bank operation, but they are also be an educator. To be an educator, the Islamic value and less-waste lifestyle should be a possessed fundamental value by themselves. A quality of generation is achieved by maximizing their role for society. Islamic law attracts the society to contribute in every aspect that can be done by their self as mention "the best of humans is those who are most useful to others". One of the goals is to increase the role of the young generation as agents of change who share and spread the spirit of eco-friendly lifestyle to the public.

The last aspect is the preservation of wealth. Wealth is an important factor in supporting the four previous aspects. The protecting of wealth in *Maqashid Sharia* is achieved by developing the ability to earn income and eliminating economic disparities. The purpose of the empowerment program by BSM is to improve the

community's economy. The activities in waste bank are categorized as a step to reach the preservation of wealth, such as depositing the waste to BSM then change into the amount of money. The money can be saved for future needs; or can be change into groceries, payment of electricity or water bills that help the society in fulfilling their primary needs.

The fundamental of Islamic principle covers both of compliance and transactions. The sharia compliance that regulating the moral and ethical standards should be addressed as guided in Islamic Law (Shariah), which includes the Qur'an, Sunnah (the practice of Prophet Muhammad), and further opinions. The first notion in implementing the Islamic waste bank is should be set the Shariah law as the root of business ethics. The Islamic law covers on what is beneficial and just are permissible and what is harmful and unjust are prohibited (Febianto, 2021). Islamic business logic is committed to the protection and advancement of public interest under the Shariah guided paradigm.

Furthermore, the Islamic law has regulated the principles of Islamic finance. Some Islamic transactions that adopted in the Islamic waste bank are : (1) the profit and loss sharing (PLS) principle is one of the most important features of Islamic finance. The two parties in transaction share business risk in return of sharing profits and losses. (2) the prohibition of riba, which is generally defined as interest or excessive interest, is the most prominent feature of Islamic feature. (3) the prohibition of *gharar* (excessive uncertainty) and *maysir* (excessive risk or gambling) that distract the transactions and lead to unfair loss between two parties. (4) the prohibition on financing for the harmful sectors or activities that are not compliance with Islamic law. These prohibited business activities can relate to food (production and sales alcoholic beverages, pork product, tobacco), gambling, entertainment and immoral and illicit trades (prostitution and drugs) (Bourkhis and Sami, 2013).

The contracts that used in the transaction also be a specialty in Islamic finance. There are a large number of different contracts in Islamic financing. Based on the contract, the Islamic financing is devided in two groups: *Tijari* (sale and purchase contract) and *Tabarru* (helping contract). Some of the tijari contracts are based on PLS such as mudharaba (trustee finance or profit sharing) and musharaka (equity participation or joint venture) and some other financial instruments are based on mark-up such as murabaha (cost-plus financing), ijara (leasing), and istisnaa (commissioned manufacture). While the tabarru contract is qard (debt with free of charge). These contracts can particularly be used in operation of waste bank management. BSM waste bank have implemented the part of existing contracts, then it can also be implemented in other waste banks.

6. CONCLUSION AND DISSCUSSION

The household waste is the highest amount of the waste contribution in Indonesia. It was effectively managed by the waste bank that implement the community-based management. The literature shows that the public participation is an important resource projects for resolving environmental problems. In waste bank implementation, both rural and urban communities can be involved in this concern. The economic concern is the attracting factor for rural communities, while the spirit of consciousness of the urban communities is their main reason to contribute. The various mutual benefits can

be reached by the society including social, economic and environmental advantage at the same time by the waste management. At the end, it will be reducing the total waste to the final disposal centre (TPA) in Indonesia.

The application of Islamic principle in this context is also relevant and visible to implement in Indonesia for some reasons. Firstly, the big population of Muslims in Indonesia is the good potential to apply Islamic waste bank management. Secondly, the spirit waste management is corresponding to the Islamic value. Since the awareness and public participation is not always positively corelated, pre-social training is required to increase community involvement. Literature shows that religious figures effectively encourage into practical awareness (participation) with religious approach such as cleanliness point of view in Islam.

Since this study matter still limited in the existing literature, more comprehensive study is needed to expand the discussion in future study. Our study has some inferences that create avenues for future research such as the fundamental implementation issues or diversification between Islamic and conventional waste bank management which makes the Islamic waste bank important to be realized.

ACKNOWLEDGEMENT

This work was supported by the *Lembaga Penelitian dan Pengabdian kepada Masyarakat (LPPM)*, i.e Research Institution and Community Service of Institut Teknologi Bandung, Indonesia.

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