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The Role of the KPSL Bina Bersama Waste Bank in Enhancing Environmental Awareness in Medan Deli

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ABSTRACT

Community-based waste management has become an important complementary approach in addressing urban waste challenges in Indonesia, particularly in densely populated areas. In Medan Deli District, persistent household waste accumulation has contributed to environmental degradation and recurrent drainage problems, highlighting the need for locally grounded interventions. This study examines the role of the KPSL Bina Bersama Waste Bank in fostering environmental awareness and waste-related behavioral change within the community directly engaged with the program. Using a qualitative descriptive approach, data were collected through semi-structured interviews with waste bank managers, active customers, and surrounding residents, supported by field observations and documentation. The analysis is guided by the Theory of Planned Behavior. The findings indicate that participating residents developed more positive attitudes toward waste sorting by recognizing both its economic value and perceived environmental benefits. Social interactions among neighbors and continuous engagement by waste bank managers strengthened subjective norms that encouraged participation. Perceived behavioral control was supported by simple registration procedures, accessible location, and flexible waste acceptance practices. These behavioral changes were associated with localized environmental improvements, including reduced visible illegal waste disposal, cleaner drainage conditions, and the establishment of routine household waste-sorting habits, as reported by informants and observed in the field. This study highlights that the effectiveness of the KPSL Bina Bersama Waste Bank is closely tied to contextual factors such as community engagement, managerial continuity, and local social dynamics.

1. Introduction

The volume of waste in Indonesia continues to increase along with population growth, modern consumption patterns, and rising economic activities of households and small businesses (Sari et al., 2023). Data from the National Waste Management Information System (SIPSN) of the Ministry of Environment and Forestry (KLHK) records that more than 19 million tons of waste are generated annually in Indonesia. This figure illustrates significant pressure on the waste management system because its capacity is not yet proportional to the amount of waste produced. This condition has broad impacts on health, settlement quality, and the sustainability of urban life. Many major cities face the same problem, namely waste production that exceeds the capacity of

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transportation services, resulting in waste frequently piling up in residential corners (Hariyanti et al., 2022; Thamrin et al., 2022).

Household waste is the largest source because domestic activities operate continuously every day (Utami et al., 2023). The habit of disposing of waste into rivers, drainage channels, or vacant land is still commonly found and causes environmental degradation (Nikmah & Budhi, 2024). Many areas experience flooding during the rainy season because drainage channels are clogged with inorganic waste such as plastic, food packaging, and bottles (Ismail et al., 2023). Waste burning is still conducted by some residents who find it difficult to locate waste disposal facilities. Smoke from burning reduces air quality and increases the risk of respiratory problems. These behavioral patterns are one of the main causes of recurring environmental disturbances in many urban areas in Indonesia (Sari et al., 2023).

Government efforts to provide waste collection points (TPS), operate transportation fleets, and conduct educational programs have not yet reached all levels of society evenly. The capacity of fleets and sanitation workers is limited, while waste generation continues daily without pause. This situation allows waste problems to appear repeatedly in various areas, especially densely populated neighborhoods that produce high volumes of waste (Rahmawati & Adinugraha, 2024; Syafer & Putera, 2024). The need for alternative approaches is becoming increasingly urgent, particularly approaches that involve communities in reducing waste at its source. Direct community participation is key to ensuring that behavioral change in waste management can occur more consistently.

The waste bank movement has become one of the strategic community-based approaches promoted in Indonesia to support urban waste reduction targets, particularly in densely populated areas (Ivakdalam & Far, 2022). National waste management policies emphasize the reduction of waste at the source through community participation, positioning waste banks as an important instrument in achieving these goals (Fitri et al., 2023). However, the effectiveness of such initiatives varies across regions, depending on local environmental conditions, community engagement, and operational capacity (Saputra et al., 2022).

The implementation of waste bank initiatives has also developed in Medan City, particularly in Medan Deli District, which is known as a densely populated and economically active area (Sagala, 2024). In Medan Deli District, high population density and intensive household activities contribute to persistent waste accumulation, particularly in drainage channels and residential corners. These conditions have resulted in recurring flooding and environmental degradation, indicating a gap between policy objectives and on-the-ground implementation. The KPSL Bina Bersama Waste Bank emerges within this context as a locally driven response to waste management challenges, operating at the neighborhood level to reduce inorganic waste disposal and encourage household waste sorting. Examining this initiative provides an opportunity to understand how national waste reduction strategies are translated into everyday practices in an urban community facing concrete environmental risks.

On the other hand, the Theory of Planned Behavior (TPB) developed by Icek Ajzen can serve as an appropriate basis for understanding behavioral changes among residents in managing waste. This theory explains that a person's behavior is influenced by three elements, namely attitudes toward the behavior, social pressure from the surrounding environment, and perceived behavioral control or the perception of ease in performing the behavior (Ajzen, 1991). These three elements can explain why some residents start sorting waste, regularly deposit waste at the waste bank, and develop new habits in treating household waste. TPB provides a structured analytical framework to understand gradual environmental behavioral change rather than sudden change.

Previous studies have discussed various benefits of waste banks from economic and environmental perspectives. Putra & Ismaniar (2020) found that waste banks increase waste-sorting behavior while also supporting household finances. Meanwhile, Pravasanti & Ningsih (2020) emphasized that waste bank programs serve as an additional source of income for housewives. However, most of these studies still focus on end results without elaborating on community behavioral processes. Analyses that examine behavioral change through attitudes, social pressure,

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and perceived ease, as explained by TPB are still rarely applied in studies on waste banks, particularly in the case of the KPSL Bina Bersama Waste Bank. This gap forms a research space that needs to be addressed.

This study was conducted to fill that gap by explaining the role of the KPSL Bina Bersama Waste Bank in encouraging behavioral change among Medan Deli residents based on the Theory of Planned Behavior. The urgency of this research arises from the need to understand the most effective measures for changing community habits in waste management, considering that waste issues continue to increase every year. The novelty of this study lies in the application of TPB to examine community behavior more systematically, allowing the analysis to illustrate both the benefits of the program and the process of behavioral formation. Therefore, this study aims to describe the relationship between waste savings, community participation, and environmental improvement as outcomes of behavioral change fostered through the waste bank movement.

2. Research Method

2.1. Research Design

This study uses a qualitative descriptive design. This design was chosen to describe the role of the KPSL Bina Bersama Waste Bank in increasing environmental awareness among residents of Medan Deli. The descriptive approach provides space to explain social phenomena based on residents' direct experiences, behavioral patterns, and the dynamics of relationships between the community and waste bank managers. This design is suitable for assessing behavioral change based on the Theory of Planned Behavior, which emphasizes attitudes, social pressure, and perceived behavioral control.

2.2. Research Location and Time

The study was conducted at the KPSL Bina Bersama Waste Bank, located on Jl. Mangaan VII, Medan Deli District, Medan City, North Sumatra. This location was chosen because the waste bank has been operating for more than a decade and serves as a primary reference point for residents in managing household waste. Data collection was carried out from January to February 2025 so that the researcher could observe operational activities and community interactions during the waste bank's active days.

2.3. Population and Sample

The study population includes residents involved in and affected by the activities of the KPSL Bina Bersama Waste Bank, including managers, active customers, and surrounding community members. Informants were selected using purposive sampling based on their relevance, level of involvement, and ability to provide rich information related to environmental behavior change. The number of informants was not determined statistically but followed the principle of data adequacy and saturation commonly applied in qualitative research. Data collection was continued until information obtained from interviews showed repetition and no new significant themes emerged regarding environmental awareness and behavioral change. The informants in this study consisted of:

1) One main waste bank manager responsible for operational activities, waste savings records, and community education.
2) Ten active customers from different age groups, genders, and occupations to capture variations in waste-sorting behavior and participation intensity.
3) Five surrounding residents who are not registered customers, living in different neighborhood sections, to provide broader perspectives on environmental changes and community awareness after the waste bank began operating.

To reduce potential bias and strengthen the credibility of findings, the study applied triangulation of data collection techniques, including semi-structured interviews, field observations, and documentation analysis. Interview data were cross-checked with direct observations of waste bank activities and environmental conditions, as well as with administrative records and visual

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documentation. This triangulation of methods allowed for validation of recurring patterns related to attitudes, social influence, and perceived behavioral control. Nevertheless, this study acknowledges limitations in perspective triangulation. The absence of local government officials and sanitation workers as informants means that the findings primarily reflect community-level experiences and managerial viewpoints. Consequently, the results should be interpreted as context-specific and exploratory.

2.4. Data Collection Techniques

The study uses several data collection techniques, namely:

1) Interviews were used to obtain information from managers and residents regarding waste-sorting habits, reasons for becoming customers, perceptions of the benefits of the waste bank, and the behavioral changes that occurred. Semi-structured interviews were conducted so the researcher could explore additional information during the process.
2) Field observation was conducted to observe the activities of the waste bank, the waste-sorting process, interactions between managers and customers, and the environmental conditions around the location. Observations helped describe residents' behavioral patterns and the program's tangible impact on environmental cleanliness.
3) Documentation includes recording waste savings books, activity photos, operational notes of the waste bank, and other relevant administrative data. This technique supports the validation of interview and observation results.
4) Literature study was used to strengthen the theoretical foundation and compare research findings with previous studies related to waste banks and environmental behavioral changes.

2.5. Data Analysis Techniques

Analysis process was carried out qualitatively using Miles & Huberman (2014) model namely:

1) Data reduction from interviews, observations, and documentation was selected, grouped, and simplified based on themes relevant to the research focus, particularly themes related to attitudes, social pressure, and perceived behavioral control in the Theory of Planned Behavior.
2) Data presentation in the form of reduced data arranged into narrative descriptions, informant quotations, and descriptions of phenomena. This presentation helps map the relationship between residents' behavior and the role of the waste bank in increasing environmental awareness.
3) Conclusion drawing through the integration of field findings with theoretical analysis. Verification was carried out throughout the study to ensure that the conclusions remained consistent with field data.

3. Results and Discussion

3.1. Operational Overview of the KPSL Bina Bersama Waste Bank in Medan Deli

The existence of the KPSL Bina Bersama Waste Bank has become a crucial part of the lives of Medan Deli residents because this program operates through collective work built from the community's everyday experiences in dealing with waste problems. The changes that have occurred developed gradually and involved a long process, starting from the formation of the management team, strengthening community participation, and improving environmental conditions. The general overview of its operations is described in the following table.

Table 1. Operations of the KPSL Bina Bersama Waste Bank

Aspect	Description
Duration of operation	Approximately 12 years, beginning in 2013 and officially recognized by the DLH in 2014
Inspiration for establishment	Inspired by experiences in Yogyakarta and by a child who discouraged littering

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Business status	Joint enterprise
Number of managers	Approximately three people
Manager responsibilities	Collecting, sorting, and transporting waste to the landfill
Environmental changes	Perceived reduction in flood duration, where stagnant water that previously lasted one to three days is reported by residents to recede within approximately three to four hours after rainfall
Types of waste accepted	Nearly all types of inorganic waste such as plastic, paper, metal, and glass
Number of waste categories	Approximately 44 types
Main obstacles	Capital and transportation
How to become a customer	Bring an ID card, fill out a form, and immediately receive a savings book

Based on Table 1, the activities of the waste bank have developed because the managers consistently carry out their tasks from year to year. They have built a simple work system that runs steadily thanks to routines already understood by residents. This consistency has fostered trust, leading many households to feel comfortable depositing their waste in the same place for many years. Social closeness between managers and residents has also formed because interactions occur continuously in an informal setting.

One of the elements that strengthens activities is the variety of waste types accepted. With around 44 waste categories, residents have greater opportunities to collect various inorganic materials from their homes. This diversity facilitates the waste savings process because many types of waste can be resold. Examples of the most frequently deposited categories include:

a) Plastic bottles from mineral water and soft drinks
b) Cardboard and shopping-related paper waste
c) Food cans and other light metal items
d) Glass from intact used containers

This variety encourages residents to be more attentive to household leftovers that may have value. On the other hand, the inspiration for establishing this activity came from a unique experience in which a manager witnessed a small child reprimanding an adult for littering. This experience left a strong impression and formed the determination to bring a similar idea to Medan Deli. This illustrates that environmental movements often originate from simple events that leave an ethical impression on someone. The study by Yusuf & Fallz (2025) also shows that personal experiences that touch one's awareness often become the basis for community-based environmental initiatives, indicating that these field findings are consistent with their research.

Figure 1. Operations of the KPSL Bina Bersama Waste Bank

The environmental impact felt by residents has become one of the most prominent aspects in the development of the waste bank. The reported reduction in flood duration is based on interview data

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and field observations rather than hydrological measurements. Informants consistently described that stagnant water in the neighborhood receded more quickly after rainfall compared to previous years. These accounts were supported by observations of cleaner drainage channels with less visible inorganic waste accumulation. However, this study does not include rainfall records, drainage capacity measurements, or systematic before-and-after hydrological comparisons. This was expressed by the manager:

> *"In the past, when it rained even briefly, the water would immediately rise to the streets and only recede after two to three days. Now, it's resolved in three or four hours because much of the waste goes into the waste bank."*

This change has had a tangible impact on residents' activities because standing water no longer disrupts mobility. Some residents even noted that the environmental improvements were more noticeable than the economic benefits. This indicates that environmental impact has become a strong driving force for the program's sustainability. Findings by Putri et al. (2025) on waste banks in Semarang Regency also show that reduced flood frequency is an indicator of success in community-based waste reduction movements.

From an operational standpoint, the managers carry out a range of demanding tasks despite having a limited number of personnel. They manage waste sorting, record savings balances, and transport waste to the final disposal site on scheduled sale days. These activities require considerable effort because waste collection is carried out every weekend and must go through repetitive processes. This situation becomes even more challenging when managers face limitations in capital and transportation facilities, requiring them to organize an efficient work rhythm so that activities can run without interruption.

Amid these operational challenges, the ease of the registration procedure has become a factor that strengthens the continuity of the program. Residents only need to bring their ID card and fill out a form to receive a savings book, allowing them to begin depositing waste immediately. This simple process enables households to participate without burdensome administrative barriers. Findings byJoko et al. (2025) show that easy registration procedures are often the main reason urban communities participate in waste bank programs, and similar patterns are observed in Medan Deli because residents noted that the process of becoming a customer is quick and practical.

3.2. Behavior Change in Waste Management Based on the Theory of Planned Behavior

Behavioral changes among the residents of Medan Deli in managing household waste can be explained through the three core components of the Theory of Planned Behavior (TPB): attitude, subjective norms, and perceived behavioral control. These components illustrate how personal evaluations, social influences, and perceptions of ease shape new habits in waste sorting and depositing at the KPSL Bina Bersama Waste Bank.

1) Formation of positive attitudes toward waste management

   The first stage of behavioral change is reflected in how participating residents and interviewed informants begin to view waste as something valuable. Active waste bank customers who were interviewed explained that inorganic waste can be converted into savings, which reshapes their perception of waste as a resource rather than a burden. Simple activities such as collecting plastic bottles or paper are perceived by these participants as actions that provide long-term economic benefits for their households.

   This attitude shift is further strengthened by the direct environmental experiences reported by informants living around the waste bank location. Improvements such as cleaner waterways,

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reduced blockages, and tidier surroundings were repeatedly mentioned during interviews and observations, reinforcing the belief among participants that waste sorting produces tangible environmental benefits.

Although these findings do not aim to statistically represent the entire Medan Deli District, they indicate a localized pattern of positive attitude formation within the community directly engaged with the KPSL Bina Bersama Waste Bank. Hutabarat & Mulyani (2022) found that positive attitudes toward waste management tend to grow when individuals experience firsthand both environmental and economic advantages. The attitudes expressed by the informants in this study reflect a similar process of awareness formation at the neighborhood level.

2) Strengthening social influences (*subjective norms*)

The second component highlights the role of social influence in reinforcing behavioral change, as evidenced by interview data and field observations. Several active waste bank customers reported that they began sorting household waste after observing neighbors who regularly deposited waste at the KPSL Bina Bersama Waste Bank. Informants explained that seeing familiar individuals participate reduced hesitation and encouraged them to adopt similar practices. One informant stated:

> *"At first, I didn't really think about sorting waste, but after seeing my neighbors regularly bringing plastic bottles to the waste bank, I started doing the same. It felt normal because many people around me were already doing it."*

This pattern was also supported by direct field observations, which showed that waste-depositing activities often occurred collectively, particularly on scheduled waste bank days, where residents interacted, exchanged information, and observed each other's participation. These social interactions contributed to the perception that waste sorting had become a common and socially accepted practice within the immediate neighborhood. In addition, interview results indicate that waste bank managers played an important role in shaping subjective norms by consistently providing information about waste categories, deposit schedules, and registration procedures. Informants mentioned that managers frequently reminded residents during informal encounters, such as neighborhood gatherings or waste deposit days. As expressed by one non-customer resident living near the waste bank:

> *"Even though I'm not registered, I often hear the managers explaining about waste sorting when people gather. It makes you feel encouraged because everyone talks about it."*

These empirical findings indicate that social influence within the community directly surrounding the waste bank contributes to the adoption of waste-sorting behavior. Fakih & Sa'id (2021) emphasize that social norms in densely populated communities strongly influence pro-environmental behavior. The interview and observational data in this study reflect a similar mechanism at the neighborhood level in Medan Deli.

3) Strengthening perceived behavioral control

The third component explains how interviewed participants felt capable of performing waste sorting and depositing due to the accessibility of the program. Interview data from active waste bank customers indicate that the registration process was perceived as simple and non-burdensome. Informants explained that they only needed to bring an ID card, complete a short

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form, and immediately receive a savings book, which increased their confidence to start participating without hesitation.

This perception was reinforced by field observations, which showed that new customers were able to complete the registration process and deposit their waste on the same day without additional administrative steps. Several informants mentioned that this simplicity made waste depositing easy to integrate into their daily routines. One informant stated:

> *"I didn't need to prepare anything complicated. I registered and deposited waste on the same day, so it felt easy to start."*

The waste bank's location within the residential area further strengthened this sense of control, as interviewed residents explained that they could deposit waste during routine neighborhood activities with minimal disruption to their daily schedules. In addition, the acceptance of approximately 44 types of inorganic waste allowed households to deposit almost all recyclable items they generated, reducing confusion about waste categories. This was frequently mentioned by informants as a reason for their continued participation. These findings are supported by a statement from the waste bank manager:

> *"To register, you just bring your ID card, fill in a few details, and you'll get the savings book right away. People join quickly because the process is easy."*

Taken together, the interview and observational data demonstrate that perceived behavioral control among participating residents was shaped by simple procedures, accessible location, and flexible waste categories. Ismail & Handrito (2024) argue that perceived behavioral control is a key factor in sustaining environmental programs in urban areas, and the empirical findings from this study reflect a similar mechanism within the local context of the KPSL Bina Bersama Waste Bank.

The three components of TPB work together to form a reinforcing cycle. Positive attitudes motivate individuals internally to continue sorting waste because they witness direct environmental and economic benefits. Social influences from family, neighbors, and waste bank managers strengthen external motivation. Meanwhile, perceived ease of participation makes residents feel capable of consistently carrying out waste sorting without significant effort.

The integration of these factors results in a sustained behavioral pattern rather than a short-term change. Waste depositing has now become a weekly routine for many households, viewed as a normal part of daily life. This pattern embeds the waste bank more deeply into the lifestyle of Medan Deli residents. These findings are in line with Mardiyah et al. (2021), who argue that community-based behavioral change is more likely to persist when environmental benefits are directly felt and participation processes are straightforward. This is precisely what occurs in the KPSL Bina Bersama Waste Bank, where positive experiences, social influences, and perceived ease merge into a collective habit of more responsible waste management.

3.3. The Role of the KPSL Bina Bersama Waste Bank in Enhancing Environmental Awareness

The role of the KPSL Bina Bersama Waste Bank in enhancing environmental awareness is evident from both behavioral changes among residents and the physical transformation of the Medan Deli area. The long-running program has encouraged the community to pay closer attention

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to environmental conditions by developing household-level waste reduction habits. The roles are summarized in the following table:

Table 2. Environmental Roles of the KPSL Bina Bersama Waste Bank

Type of Role	Environmental Impact
Reduction of illegal waste	Decrease in waste dumping on roadsides and neighborhood corners
Drainage improvement	Reduced accumulation of inorganic materials in drainage canals
Shorter flood duration	Faster receding of stagnant water after rainfall
Waste-sorting habits	Residents routinely sort waste at home
Cleaner surroundings	Neighborhoods appear tidier and more orderly

Based on Table 2, the rise in environmental awareness among residents is closely tied to the increasingly established habit of waste sorting. This habit emerges as residents observe that their surroundings become cleaner when they consistently participate in the program. Sorting waste daily makes residents more attentive to plastic bottles, cardboard, and other materials that they would have previously discarded without consideration. This routine becomes an entry point for building stronger environmental consciousness. Susanto & Alhsani (2023) found that environmental habits performed repeatedly can strongly influence the psychological readiness of communities to maintain environmental cleanliness, a pattern that is clearly observable in Medan Deli.

The waste bank's role becomes apparent at the neighborhood level in relation to the reduction of illegal waste disposal. Interview data indicate that participating residents began to recognize the economic value of inorganic waste, which encouraged them to reduce dumping waste on street corners within their immediate surroundings. As reported by informants and supported by field observations, areas around the waste bank location appeared more orderly compared to previous conditions. However, these changes should be understood as localized behavioral and environmental improvements rather than comprehensive solutions to urban waste problems.

Informants and managers acknowledged that broader waste management outcomes in Medan Deli remain influenced by factors beyond community control, including municipal waste transportation schedules, policy implementation, and landfill management practices. In this sense, the waste bank functions as a complementary community-based intervention that helps mitigate everyday waste disposal practices but does not replace structural waste management systems.

Managers noted that residents have become increasingly active in bringing recyclable waste to the waste bank because they perceive both environmental and household-level benefits. This participation contributes to reduced visible waste accumulation in certain residential areas, while simultaneously highlighting the continued need for integrated waste governance at the city level.The program also contributes significantly to drainage improvement. Before waste-sorting activities became intensive, drainage canals were frequently clogged with plastics and small metal items.

Once residents routinely sorted their waste, these materials no longer ended up in the waterways, allowing water to flow more smoothly. This improvement directly affects flood duration, with stagnant water now receding much faster after rainfall. Residents expressed relief at these changes after years of experiencing prolonged flooding. Rokilah et al. (2025) similarly found that the reduction of inorganic waste in drainage systems is often closely linked to the presence of active waste banks, making the situation in Medan Deli strongly aligned with their findings.

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The narrative of environmental improvement is closely connected to the Theory of Planned Behavior (TPB). Positive attitudes among residents toward waste sorting develop because they experience its direct environmental benefits. This perception reinforces their willingness to participate, as reductions in illegal waste and improvements in drainage become visible in daily life. Social influence from family, neighbors, and waste bank managers further strengthens this habit, as waste-depositing activities often take place in a communal and friendly setting. These interactions gradually create new social norms that encourage ongoing participation.

Perceived behavioral control also contributes significantly to building environmental awareness. Residents feel capable of practicing waste sorting because the waste bank system does not require complicated procedures. Its convenient location, regular schedule, and acceptance of a wide range of waste types give residents confidence that they can sustain these environmental practices. The three elements of TPB blend naturally into residents' everyday experiences, allowing environmental awareness to manifest not merely as knowledge but as a deeply rooted behavioral pattern. The environmental roles produced by the KPSL Bina Bersama Waste Bank indicate that behavioral change, improved drainage conditions, reduced illegal waste disposal, and the establishment of household waste-sorting habits interact in a mutually reinforcing cycle within the specific social context of the community studied. This cycle emerged not solely from the waste bank mechanism itself, but also from contextual factors such as sustained managerial leadership, long-term community engagement, and existing social trust between residents and waste bank managers.

While these findings illustrate a localized success, they do not imply that the KPSL Bina Bersama model can be directly replicated in other urban areas with different social, economic, or institutional conditions. Variations in community cohesion, leadership capacity, and historical experience with collective action may significantly influence the effectiveness of similar initiatives elsewhere. From a policy perspective, the findings suggest that the effectiveness of community-based waste banks depends not only on technical arrangements, but also on social variables such as leadership continuity, community history, and social capital. These factors should be considered as key variables in designing and scaling waste bank programs in other regions. Without attention to these contextual dimensions, replication efforts may yield uneven outcomes.

4. Conclusion

Based on interview and field observation data collected from waste bank managers, active customers, and surrounding residents, this study shows that the KPSL Bina Bersama Waste Bank plays a meaningful role in fostering environmental awareness within the community directly engaged with the program in Medan Deli. Empirical findings indicate that residents who actively participated in waste bank activities experienced changes in how they perceived and managed household waste, particularly through routine waste sorting and regular waste depositing practices. The findings demonstrate that the three core components of the Theory of Planned Behavior, attitudes, subjective norms, and perceived behavioral control are reflected in the empirical data. Positive attitudes emerged as informants reported recognizing both economic value and visible environmental improvements, such as cleaner drainage and reduced waste accumulation. Subjective norms were strengthened through social interactions observed during waste deposit activities and through informants' statements describing encouragement from neighbors and waste bank managers. Perceived behavioral control was shaped by simple registration procedures, the accessibility of the waste bank location, and the acceptance of a wide range of inorganic waste types, all of which were consistently mentioned in interviews.

These behavioral changes were empirically linked to observable environmental outcomes at the neighborhood level, including reduced illegal waste disposal, shorter flood duration after rainfall,

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and the establishment of routine household waste-sorting habits, as documented through field observations and informant accounts. This indicates that the transformation fostered by the waste bank is not merely structural but embedded in everyday behavioral practices of participating residents. Strengthening the role of the KPSL Bina Bersama Waste Bank, as suggested by the empirical findings, requires targeted managerial, infrastructural, and educational support. Informants and managers highlighted limitations in transportation and operational capacity, indicating the need for increased logistical support to sustain activities. Expanding environmental education through community meetings and local schools may further reinforce positive attitudes and social norms observed in this study. Local government involvement remains essential to enhance sustainability. Regulatory facilitation, provision of operational facilities, and integration of waste bank initiatives into municipal waste management policies could address the operational constraints identified in the field. Future research may build upon these empirical findings by exploring additional psychological and social dimensions, such as long-term habit formation and risk perception, to further refine community-based waste management models in urban contexts similar to Medan Deli.

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