

Liquid Organic Fertilizer as a Medium for Health and Entrepreneurship Education: Collective Efficacy among Women Scavengers at TPST Piyungan

Pupuk Organik Cair sebagai Media Pendidikan Kesehatan dan Kewirausahaan: Analisis Collective Efficacy Perempuan Pemulung di TPST Piyungan

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Abstract

Unmanaged organic waste at Integrated Waste Processing Sites (TPST) poses significant public health risks. Transforming this waste into Liquid Organic Fertilizer (LOF) has emerged as a form of community education that integrates health promotion with entrepreneurial practice to improve overall well-being. This study examines how collective efficacy, expressed through mutual trust, solidarity, and cooperation among women waste pickers, fosters the implementation of community-based health and entrepreneurship education. The research was conducted at the Piyungan TPST in Yogyakarta from 2019 to 2021 through participatory observation involving 30 housewives from women scavenger groups and an additional 78 active waste pickers whose health data were identified. Data were analyzed qualitatively using a thematic analysis approach. The findings indicate that strong social cohesion and shared goals enhanced participation in LOF processing, improved health literacy, and stimulated a sense of entrepreneurship, such as small-scale household fertilizer production for both personal use and local sale. Nevertheless, the sustainability of the program remains limited by inadequate business capital, insufficient training, and weak institutional support. The study concludes that strengthening collective efficacy, when integrated with community health and entrepreneurship education and supported by cross-sectoral collaboration—particularly in financing, technical capacity building, and sustainable policy frameworks—can significantly improve the welfare and resilience of women waste pickers.

Keywords

Liquid Organic Fertilizer; Collective Efficacy; Health and Entrepreneurship Education; Women Empowerment

Abstrak

Sampah organik yang tidak terkelola di Tempat Pengolahan Sampah Terpadu (TPST) dapat menimbulkan risiko kesehatan. Pengolahan sampah organik menjadi pupuk organik cair (POC) dipandang sebagai sarana pendidikan masyarakat yang dapat meningkatkan kesejahteraan melalui edukasi kesehatan dan praktik kewirausahaan. Penelitian ini bertujuan menganalisis bagaimana collective efficacy, gotong royong, dan rasa saling percaya antar perempuan pemulung, mendorong terlaksananya kegiatan pendidikan berbasis komunitas. Penelitian dilakukan di TPST Piyungan, Yogyakarta, selama periode 2019–2021 menggunakan metode observasi partisipatif terhadap 30 ibu rumah tangga dari kelompok perempuan pemulung, serta 78 pemulung aktif yang diidentifikasi data kesehatannya. Data dianalisis secara kualitatif dengan pendekatan analisis tematik. Hasil menunjukkan bahwa solidaritas dan keinginan bersama dapat memperkuat partisipasi dalam pengolahan POC, meningkatkan literasi kesehatan, dan membentuk jiwa kewirausahaan sederhana seperti produksi organik rumah tangga untuk dipakai dan dijual. Namun, keterbatasan modal usaha dan sumber daya manusia untuk pelatihan masih menghambat keberlanjutan program. Penelitian ini menegaskan bahwa peningkatan kesejahteraan perempuan pemulung dapat dicapai melalui penguatan collective efficacy yang diintegrasikan dengan pendidikan kesehatan dan kewirausahaan. Serta dukungan lintas sektor berupa pembiayaan, pelatihan teknis, dan kebijakan yang berkelanjutan.

Kata Kunci

Pupuk Organik Cair; Collective Efficacy; Pendidikan Kesehatan dan Kewirausahaan; Pemberdayaan Perempuan

1. Introduction

In numerous developing areas, the growing difficulties of managing urban waste, especially related to organic materials, present serious threats to public health and environmental harm (Santhyami et al., 2022). Integrated Waste Processing Sites, although designed to address these challenges, frequently turn into centers for the spread of vector-borne illnesses like diarrhea, acute respiratory infections, and dengue fever, directly affecting nearby communities (Santhyami et al., 2022). Consequently, efficient community health education is vital to avert environment-related diseases and promote sustainable waste management methods (Andriani et al., 2022).

The creation and use of Liquid Organic Fertilizer (LOF/POC) offer a twofold advantage, both minimizing health risks linked to organic waste and encouraging the intake of organically cultivated food, thus improving community health. This study examines the role of collective efficacy among women scavengers in promoting the use of Liquid Organic Fertilizer processing as a dual approach to enhance community health and support household economic empowerment (Mamun et al., 2020). This research focuses on examining how collective efficacy among women scavengers contributes to the promotion of Liquid Organic Fertilizer processing, facilitating enhancements in community health and ensuring economic stability for households.

Drawing on established theoretical models, this study suggests that the relationship between social cohesion and collective expectations for action, as defined by Collective Efficacy Theory, is crucial for comprehending how marginalized groups can effectively adopt sustainable waste management practices (Kandpal & Saizen, 2019). This method emphasizes that community-based initiatives, grounded in participation and common goals, can tackle intricate environmental health issues more efficiently than top-down interventions (Widyatmika & Bolia, 2024). In particular, it examines how these initiatives can empower women scavengers, shifting their positions from simple waste collectors to proactive agents of environmental and economic transformation, ultimately aiding in the creation of a more resilient community (Andriani et al., 2022).

This study focuses on the situation at TPST Piyungan, Yogyakarta, where poor organic waste management has traditionally led to increased health hazards for local residents, highlighting the critical necessity for new community-driven solutions (Araune et al., 2024). This research explores the possibility of empowering women scavengers by producing Liquid Organic Fertilizer to reduce these risks and improve community welfare.

The theoretical foundations of this study are based on Collective Efficacy Theory, which argues that robust social cohesion along with common expectations for collaborative action can enhance a community's ability to attain health and livelihood objectives (Budeanu et al., 2024). This theoretical perspective is especially relevant for comprehending how community-driven projects, like the creation of Liquid Organic Fertilizer, can change behaviors and results related to environmental sanitation (Dewi, 2021).

While the advantages are acknowledged, numerous community-based waste management initiatives encounter sustainability hurdles, frequently stemming from a focus on short-term financial gain, where tasks such as plastic collection produce quicker monetary rewards compared to producing organic fertilizer (Mulasari et al., 2024). This requires exploring methods to effectively reshape the economic motivations for female scavengers, making certain that the longer-term advantages of LOF production are viewed as at least as valuable, if not more so, than the short-term gains from plastic waste (Widyatmika & Bolia, 2024). The aim of this study is to examine how the collective efficacy of women scavengers influences the processing of Liquid Organic Fertilizer as a means to enhance community health and promote economic empowerment for households (Fajarwati et al., 2020).

1.1. Theoretical Framework

The concept of collective efficacy emphasizes the common conviction within a group regarding its capacity to coordinate and carry out the actions necessary to achieve a specific goal (Yaakobi, 2018). This encompasses the notion that joint endeavors can have considerable importance, even if personal inputs may appear inadequate (Miller & Rice, 2024). This

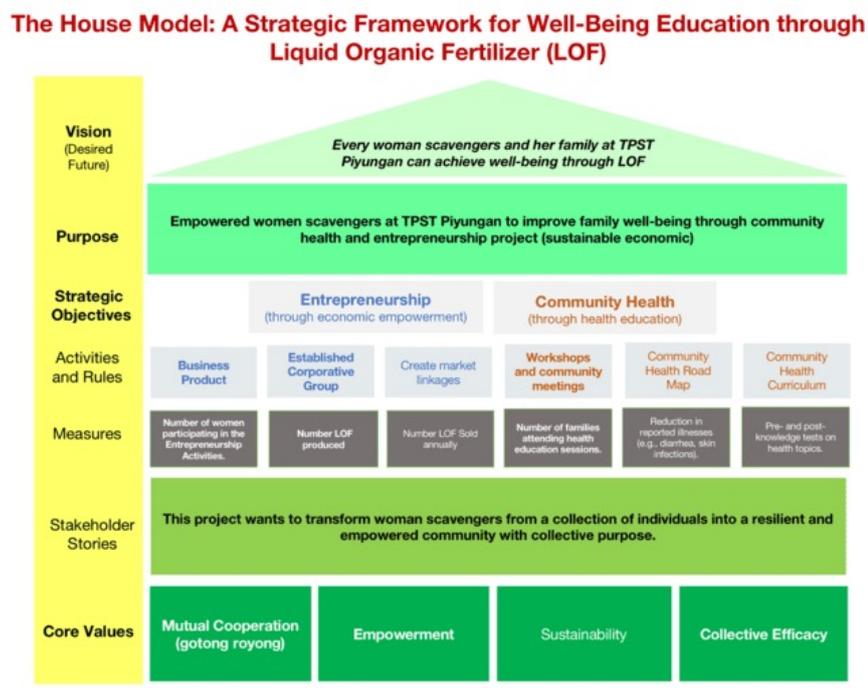


Figure 1. The House Model of Well-Being Education

encompasses the idea that joint endeavors can have a substantial impact, even if personal inputs may appear inadequate (Miller & Rice, 2024). This viewpoint underscores that collective efficacy, instead of individual efficacy, serves as a vital factor in tackling significant social issues where results depend on synchronized group actions (Sustainable Consumer Practices, 2022).

This theoretical perspective, consequently, sets itself apart from personal self-efficacy by highlighting the collaborative strength of collective agency in fulfilling shared goals, especially pertinent in situations demanding significant teamwork for environmental and social advancements (Meijers et al., 2022; Sustainable Consumer Practices, 2022). This framework is crucial for comprehending how social cohesion and mutual trust among women scavengers enable their participation in LOF processing despite existing economic drawbacks, ultimately resulting in better health outcomes and economic empowerment for the whole community.

The type of collective efficacy can be further specified as collective outcome expectancy, which indicates the perceived probability that group actions will result in favorable outcomes (Choi & Hart, 2021). Sampson (1997; 2012) argues that social cohesion and mutual

expectations for behavior among community individuals enhance a shared ability to tackle common objectives, such as better health and sustainable living. This combined capability enables the execution of community-oriented solutions, like using treated waste in urban organic agriculture, which simultaneously tackles waste management and food security (Darwin et al., 2023).

This common conviction in the group's capacity to reach intended goals is essential for maintaining collective efforts, especially when confronted with economic deterrents or limitations on resources (Nery et al., 2017). This effectiveness can impact health habits and hygiene practices in a community (Dewi, 2021), especially important for at-risk groups such as informal waste collectors (Maneen et al., 2025).

Furthermore, collective efficacy includes several sub-domains such as social cohesion, social control, and social capital, all of which enhance a group's capacity to achieve common goals effectively (Delea et al., 2018). In waste management and public health initiatives, collective efficacy can thus influence the uptake of new behaviors, like converting human waste into agricultural resources, by bolstering community determination

against existing norms or economic challenges (Gwara et al., 2022; Ejigu & Yeshitela, 2024). This emphasizes the significance of utilizing collective efficacy to address obstacles to sustainable practices by promoting a common sense of accountability and competence within the community (Cookey et al., 2020).

The comprehensive framework of collective efficacy practices in this study is presented above with a long-term education activities perspective, The House Model: A Strategic Framework for Well-Being Education through LOF. Based on the given model of empowerment, there are activities and measures excluded in the result and discussion due to the social and structural barriers. However, the core values underline the whole agenda given to the community at TPST Piyungan. Further analysis will be elaborated at the result and discussion section.

Additionally, this theoretical perspective is especially valuable for comprehending how marginalized groups, frequently sidelined from dominant economic and political resources, can harness their internal capabilities to promote collective efforts for community enhancement and poverty alleviation (Mwiti & Goulding, 2017). This framework is crucial for analyzing how groups, such as women scavengers, can collaboratively tackle intricate health and socioeconomic issues through common values and coordinated actions.

This research further focuses on how the joint conviction among women scavengers in their ability to collaborate and perform actions in LOF processing results in concrete health and economic advantages for the community (Mzimela & Moyo, 2023). This entails analyzing how their joint efficacy not only boosts their ability for environmentally friendly behaviors but also greatly aids their overall health and economic durability (Cuadrado et al., 2021; Meijers et al., 2022). However, the House Model elaborates the findings for implementation and achievability.

2. Methods

This research utilized a qualitative, participatory observation approach to examine the dynamics of collective efficacy among female scavengers at the Integrated Waste Processing Site (TPST) Piyungan, Yogyakarta, Indonesia (Wenzel, 2024). This method

offered a comprehensive insight into the social interactions and common meanings that support their involvement in Liquid Organic Fertilizer (LOF) processing (Sunarti et al., 2020). By means of continuous and direct observation, the research documented how collective efficacy appears in everyday actions, providing detailed, context-oriented perspectives on community health and livelihood programs (Firmansyah et al., 2023).

The interactive aspect of the observation facilitated the recognition of motivations, challenges, and coping mechanisms encountered by participants, uncovering the connection between social cohesion and environmental efforts (Eslit, 2023). Carried out from 2019 to 2021, the extended involvement provided a longitudinal perspective on how leadership, peer assistance, and collaborative problem-solving facilitated continued involvement in LOF production despite financial limitations (Hayati et al., 2023).

The study focused on 30 women scavengers who are also homemakers, deliberately chosen to reflect those most impacted by and involved in waste management efforts. This demographic emphasis underscored the connection between their household responsibilities and practices that generate income while benefiting the environment. Data were gathered via field observation, casual group discussions, and detailed interviews, accompanied by field notes and visual documentation (Bardosh et al., 2020). These complementary approaches facilitated data triangulation, guaranteeing a comprehensive insight into the experiences of women and their collective actions (Mwiti & Goulding, 2017; Wibowo et al., 2023).

Ultimately, the data were examined through thematic qualitative analysis, methodically recognizing and interpreting patterns associated with collective efficacy, participation, and empowerment in the community (Ahmad et al., 2019; Manurung & Pertiwi, 2023; Atmadja et al., 2023).

3. Results and Discussion

The analysis uncovered important insights that clarify how collective efficacy enhances LOF processing among women scavengers, serving as a dual approach for community health and economic empowerment. These results emphasize the intricate interaction of social

factors, economic motivations, and environmental awareness that influences community-driven waste management efforts (Utami & Godjali, 2020; Ramdhon et al., 2023). Strong social cohesion among the women promoted mutual trust and solidarity, directly impacting their involvement in LOF processing.

3.1. Result: The Benefit of Collective Efficacy, Barriers, Economic Preferences

Collective involvement, grounded in common social standards, showed a transformative capacity that exceeded simple economic advantage, resonating with larger objectives of community welfare (Acheson et al., 2024). This highlights the significance of cultivating strong social connections and common goals to enhance the effectiveness of community efforts (Caingcoy, 2025). Thus, the verses listed below address the importance of social cohesion among individuals in influencing collective action and demonstrating particular preferences.

3.1.1. Health Education Necessity

Research shows that scavengers at TPST admit to complaining about not having received health checks for more than a year, resulting in various health complaints being reported, but no follow-up action has been taken by the government. This study states that structural changes are urgently needed, including health check-ups and education, which require the involvement of the local government. The delay in implementing The House Model to the point where LOF is sold and generates the expected well-being is also due to the government's lack of attention to health education and minimal attention to economic conditions, which will be explored further in the next passage.

Health conditions were identified from the 78 waste pickers at the Piyungan TPS, including 30 female waste pickers involved in the LOF production and education process. It reveals more than half complained of various health conditions such as headaches, coughing and shortness of breath, aching and pain, and nausea. Only 41% stated that they did not experience any symptoms. The symptoms experienced by most were periodic headaches that did not subside, as well as muscle aches and bone pain.

The research indicates excessive exposure to organic waste, a source of disease that is not properly processed, and a physical connection to the activity of transporting plastic waste to be collected and resold. Most of the scavengers at the Piyungan TPST are over 45 years old, with some even reaching 70 years of age and still actively working as scavengers. Meanwhile, the other 37% are between 30 and 45 years old.

This data illustrates that most scavengers are no longer productive. Scavenging plastic waste and sorting it requires a lot of energy, a hunched posture, and careful sorting. Meanwhile, organic waste can be collected from household waste, which residents have been disposing of in the scavenging area. Additionally, organic waste can be managed more easily without requiring excessive physical labour. This finding highlights the urgency of why plastic waste management processes could actually be carried out by younger waste pickers, while those who are less productive due to age or physical health issues could manage organic waste while adding business value. Besides, the collective efficacy among the elderly is embedded more prominently.

3.1.2. Participation in LOF and The Dual Benefit of Collective Efficacy

The results of this study indicate that female waste pickers at the Piyungan TPST have a significant sense of social unity and mutual trust, which forms the basis for their collaborative effectiveness in producing Liquid Organic Fertiliser (POC). From 2019 to 2021, participatory observations showed that the women routinely collaborated in managing plastic waste collection, processing, and resale it to the collector.

Their joint activities ranged from casual conversations about family health and home hygiene to the management of household waste that was still being disposed of indiscriminately. After being introduced to LOF, they demonstrated that its production was an effort that not only improved health but also strengthened the community. They collaborated to collect organic household waste from kitchen waste and prepared their yards for liquid fertilizer storage bins. Some of them even invited their husbands to join and took the initiative to resell the maggots that grew from the liquid fertiliser processing.



Figure 2. Health and Entrepreneurship Education Activities

This association of housewife waste pickers fosters a belief among its members that their joint efforts can bring tangible health and financial benefits to their families. Through mutual cooperation and trust, this research supports the idea that social trust and shared norms play a role as drivers of collective effectiveness in marginalised waste management communities that deserve intensive education. Therefore, The House Model was created as a framework for empowerment implementation.

The research revealed that collective efficacy appeared as coordinated effort within two linked areas: (1) Community health education; and (2) Entrepreneurship development. These areas align with the dual foundations of the House Model for Well-Being

Education, positioning "entrepreneurship" and "community health" as complementary routes to well-being. Women's participation in workshops and informal educational sessions on health subjects—including health examination, nutrition education, healthy lifestyle—led to significant enhancements in health literacy and household behaviors.

At the same time, collective entrepreneurship initiatives arose as women started to involve the process of LOF production, form cooperative groups, and seek out market connections. These initiatives not only improved economic capability but also fostered a collective sense of empowerment. According to Collective Efficacy Theory, this kind of coordinated participation demonstrates a community's capability to convert internal unity into external collective actions that promote both health and economic results.

The qualitative analysis revealed that mutual trust and solidarity were key factors that greatly increased the women's readiness to engage in LOF processing, even when confronted with more urgent economic options (Wondimu et al., 2023). This inherent social support network served as a strong motivator, surpassing personal economic reasoning by encouraging a shared dedication to environmental sustainability and community health.

Moreover, this sense of community played a crucial role in forming informal networks for sharing knowledge, enabling the spread of best practices and problem-solving methods in LOF production among participants (Berns et al., 2022). This mutual comprehension and collaborative learning atmosphere strengthened the social connections, rendering the LOF processing initiative more robust against external difficulties and personal obstacles.

The collective efficacy of women scavengers was notably more apparent and influential when the handling of LOF was framed as offering dual advantages: enhancing community health and generating income (Bottazzi et al., 2023). This twofold strategy directly addressed the previously identified barriers by integrating both immediate financial incentives and long-lasting health advantages, thereby fostering greater engagement and commitment among the women (Widyatmika & Bolia, 2024). However, in practice, scavengers still really

need help from third parties to process household waste into saleable goods.

Nevertheless, the presence of strong social ties and supportive networks among the women scavengers was crucial for initiating and sustaining collective actions, particularly in activities requiring continuous collaboration and dedication (Shaikh et al., 2017). This inherent social capital facilitated the establishment of shared expectations and collective responsibilities, which are key components of collective efficacy as defined by Sampson (Wilson et al., 2024). Despite various financial constraints, they willingly gathered at various meetings for training on fertiliser production and simple explanations about the entrepreneurial mindset.

This deep understanding of collective efficacy provides crucial insights into the interactions of community waste management and the factors necessary for its sustained success. The findings suggest that fostering robust social relationships and shared objectives is essential for enhancing the efficiency of local waste management initiatives, especially when associated with tangible economic and health benefits (Oh & Hettiarachchi, 2020). The formation of these cooperative structures, along with the inherent desire for community betterment, ignited the development of shared expectations regarding health and environmental stewardship (Rabinovich et al., 2020). Thus, with high expectations for improved economic conditions and better health, collective efficacy succeeded in naturally fostering a spirit of well-being among residents.

3.1.3. Barriers to LOF Processing

However, various major challenges hindered the complete achievement of the LOF initiative's potential, such as ongoing financial limitations and the lack of sufficient entrepreneurship training for the participating women. Additionally, the quick economic appeal of conventional plastic scavenging frequently eclipsed the gradual, long-term advantages linked to LOF production, fostering a perpetual conflict between immediate financial profit and sustainable methods (Purnamawati et al., 2020).

The House Model further clarifies how women's collective efficacy transitioned from personal involvement to organized, quantifiable community

actions. In truth, though, the initiative's advancement only attained the production stage of Liquid Organic Fertilizer (LOF). Women independently developed and experimented with the fertilizer on their home plants, demonstrating encouraging outcomes in enhancing soil fertility and increasing crop yield. Nonetheless, inadequate policy support hindered the sustainability and scalability of their initiatives (Widyatmika & Bolia, 2024).



Figure 3. Liquid Organic Fertilizer Production House

After attempting to make the community self-sufficient in management, namely by allowing them to process independently for one month, it turned out that the most difficult challenge was sales. Expectations of income initially made them enthusiastic, but it turned out that the most difficult phase was actually after the results were achieved. The packaging was properly labelled, but sales were facing difficulties because the production was located in a slum area.

The initiative did not progress to the phases of sales training or marketing execution. Training on market

access, packaging, and business management remained unfinished because of the limited number of facilitators and the lack of steady governmental support. This partial implementation shows that although collective efficacy successfully encouraged the women to take action and sustain engagement in production, its transformative potential was limited by the absence of external institutional support. Consequently, the community's shared drive was unable to completely develop into a sustainable business framework that could produce consistent earnings.

3.1.4. Orientation and Economic Preferences

The strong emphasis on immediate earnings from plastic collection created a significant barrier to sustained involvement in LOF production, since the financial benefits of LOF were perceived as long-term and less certain. This financial scenario often forced a choice between meeting pressing domestic needs via plastic sales and the delayed, though ecologically beneficial, advantages of LOF, thereby obstructing the full adoption of sustainable methods (Widyatmika & Bolia, 2024).

This economic preference among women highlighted the need for more robust, prompt incentives to concentrate on LOF production, consequently reducing the gap between perceived profitability and health benefits (Phan et al., 2023). The inclination for immediate cash from plastic recycling over the slower profits from LOF processing underscores a major economic barrier that limits the sustainable viability of organic fertilizer production, despite its clear health benefits (Gall et al., 2020).

The situation highlights the need to integrate financial rewards that align better with the immediate economic needs of women scavengers to ensure the sustainability and expansion of LOF initiatives. This underscores the complex interplay between poverty, politics, and waste management, necessitating a careful approach that considers both formal and informal management systems when creating social and economic interventions (Mpanang'ombe et al., 2021). This approach is essential as insufficient funding and minimal stakeholder engagement often hinder the adoption of LOF as a

breakthrough for sustainable waste management initiative (Fanelli, 2021).

3.2. Discussion: Interpretation of Findings and Implications

The formation of these collaborative structures, alongside the intrinsic desire for community betterment, catalyzed the development of shared expectations regarding health and economic

3.2.1. Interpretation of Findings

The collective dedication to community health and environmental enhancement, coupled with supportive networks, enabled the women to collaboratively tackle waste management issues (Sahoo et al., 2022). This collaborative entity reflects findings in various community-oriented management settings, where the ability of individuals to autonomously organize, combined with strong leadership, is vital for starting local management initiatives (Velázquez et al., 2022). The collective efficacy framework highlights how the interaction of social cohesion and mutual expectations can convert individual actions into a strong communal ability to address intricate socio-environmental challenges, even in situations with limited resources (Widyatmika & Bolia, 2024; Yeasmin et al., 2017).

This situation highlights that the persistence of collective efforts is largely reliant on ongoing institutional and policy backing. Economic and structural obstacles—like restricted access to micro-capital, insufficient entrepreneurship education, and poor market integration—limited the program's ability to grow beyond subsistence level. Without unified support via cross-sector collaboration among governmental bodies, NGOs, and educational institutions, the current collective efficacy may eventually diminish.

Thus, enhancing women's collective efficacy necessitates changing it from a socially motivated effort into a structurally backed system. The foundational layer of the House Model illustrates that incorporating mutual cooperation, empowerment, sustainability, and collective efficacy as core institutional values is crucial for maintaining community-driven education in health and

entrepreneurship, which can further improve holistic well-being for women and their families.

This collective efficacy, however, was not evenly felt, as more marginalized individuals might receive lesser advantages because of prevailing patriarchal and gender norms (Beck et al., 2021). Additionally, the effectiveness of collaborative efforts such as LOF processing frequently relies on tackling fundamental power disparities that may obstruct the fair allocation of resources and opportunities in a community (Yeasmin et al., 2017).

Additionally, efforts to enhance sanitation results can be greatly strengthened when combined with financial incentives and a grassroots strategy that empowers women, acknowledging their vulnerable status and capacity for economic empowerment (Roelen & Rodriguez, 2024). This method corresponds with research indicating that community identification and perceived social support play vital roles in encouraging collective action for environmental sustainability, particularly in non-Western settings where social contexts significantly shape behavior (Rabinovich et al., 2020; Dinh et al., 2024).

3.2.2. Implication of Study

The alignment of collective efficacy with dual benefits—health improvement and income generation—suggests that health education programs should explicitly integrate economic empowerment components to ensure sustained engagement and impact (Anderson et al., 2023). This integrated approach leverages the intrinsic motivation for improved livelihoods while addressing critical public health concerns within the community (Sakas et al., 2022; Adetunji et al., 2023). This strategy not only enhances self-efficacy among participants by fostering a sense of agency, but also strengthens the overall collective efficacy within the group by demonstrating tangible returns on collaborative efforts (Anderson et al., 2023).

Furthermore, understanding the existing barriers to women's participation, such as opportunity costs related to domestic responsibilities and lack of training, is crucial for designing more effective interventions (Caruso et al., 2021). Such interventions must therefore consider the psychosocial environment of participants, as collective

efficacy beliefs are precursors to engagement and can map resources for their contribution (Kuchenbaur & Peter, 2021).

Moreover, these findings highlight that when group initiatives, such as LOF production, resonate with participants' personal goals for health and well-being, coupled with clear financial incentives, motivation, commitment, and engagement are substantially enhanced, fostering the development of social capital within the community (Dominicis et al., 2025). To further bolster collective efficacy, it is imperative to address the identified barriers, such as limited financial resources and inadequate entrepreneurship training, through targeted interventions. This could involve microfinance initiatives or skill development workshops focused on business management and marketing strategies for LOF products (Caruso et al., 2021).

Furthermore, integrating health education with microfinance and income-generating activities has been shown to improve women's health outcomes, particularly in rural settings (Isangula, 2012). Such integrated programs not only enhance the financial stability of women scavengers but also provide sustained motivation for their participation in health-promoting activities and foster women's empowerment (Maldonado et al., 2020; Audu et al., 2025). The establishment of supportive policy frameworks and community-level recognition can further amplify these efforts, transforming individual endeavors into sustainable collective action (Ernst et al., 2018).

4. Conclusion

This research clearly indicates that fostering collective efficacy, especially through a model that combines health advancement and economic empowerment, is crucial for the effectiveness of community-oriented waste management efforts and for improving public health results. This method plays a critical role in enabling women scavengers, transforming their status from sidelined workers to key players in sustainable waste management and wider community development initiatives.

Our results highlight that although strong social cohesion and the development of common collective norms are important factors for participation in Liquid

Organic Fertilizer processing, short-term economic incentives can frequently eclipse the longer-term environmental advantages if both incentives are not properly aligned. Thus, it is crucial for decision-makers to take into account the adoption of both monetary and non-monetary incentive frameworks. These incentives are essential for promoting the ongoing adoption of sustainable practices, thus enabling a shift from simple intention to regular action.

Future studies should investigate the long-term effects of these programs on essential community health metrics and examine the wider socio-economic context of communities involved in the informal waste sector. Additional research is needed to comprehend how individual efficacy beliefs influence collective efficacy in promoting lasting behavioral change. Moreover, gaining a better insight into how incentives can successfully close the intention-behavior gap, especially regarding the implementation of eco-friendly practices such as zero-waste living, will be essential for upcoming interventions.

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