

Enhancing Financial Reporting Capacity for Community Waste Banks: An International Collaborative Community Engagement Program in Makassar, Indonesia

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Abstract: This community engagement program aims to strengthen the financial management capacity of community-based waste banks in Makassar City, Indonesia, through a structured training and mentoring initiative. Waste banks have emerged as an innovative approach to waste management by promoting community participation in waste sorting, recycling, and circular economic practices. However, many waste bank units continue to face significant challenges in preparing accurate and accountable financial reports due to limited knowledge of basic accounting, inconsistent record-keeping, and minimal use of digital tools. This program, implemented collaboratively by Universitas Teknologi MARA (UiTM) Malaysia and several universities in South Sulawesi under the International Association of Economic and Business, focuses on improving the competencies of waste bank managers in preparing simple financial statements aligned with fundamental accounting principles. The activities include needs assessment, training on cash flow records, balance sheets, and income statements, hands-on mentoring, and the introduction of basic digital accounting tools. The program also strengthens institutional accountability and enhances stakeholder trust, contributing to better financial governance within the waste bank ecosystem. Furthermore, the initiative supports the strategic goals of Makassar City in promoting community-based waste management and aligns with the Sustainable Development Goals (SDGs), particularly Goals 11, 12, and 17. The outcomes demonstrate increased financial literacy, improved reporting accuracy, and stronger collaboration between local communities, government institutions, and international academic partners. This program is expected to serve as a replicable model for community empowerment and sustainable environmental management.

Keywords : Community engagement; Waste banks; Financial reporting; Capacity building; Environmental management; International collaboration; Sustainable Development Goals (SDGs).

1. Introduction

Community-based waste management initiatives have become increasingly prominent in developing countries as part of efforts to address the growing challenges of urban environmental degradation, solid waste accumulation, and limited municipal waste management capacity. Waste banks, particularly those implemented in Indonesia, represent one of the most innovative community-driven approaches for promoting waste sorting, recycling, and circular economic practices. Through this model, community members are encouraged to collect and classify recyclable materials, which are then deposited in exchange for economic value. Over the last decade, waste banks have played a significant role in strengthening public participation, reducing waste transported to landfills, and supporting behavioral change toward more sustainable environmental practices. Despite these achievements, many waste bank units operate with limited administrative and financial management capabilities, resulting in weak accountability, inconsistent record-keeping, and challenges in sustaining long-term operations.

One of the most critical issues encountered by waste banks is the absence of standardized and reliable financial reporting. Although waste banks handle financial transactions—such as purchases of recyclable materials, savings accumulation, distribution of proceeds, and operational expenditures—many managers and volunteers lack formal training in basic accounting principles. As a result, financial records are often stored manually, kept irregularly, or not prepared in accordance with generally accepted accounting practices. This condition undermines the transparency of financial activities,

complicates performance evaluation, and reduces stakeholder trust, including trust from collectors, community members, partner organizations, and local government agencies. Strengthening the financial reporting capacity of waste bank managers is therefore essential for ensuring institutional sustainability and accountability.

In response to these challenges, collaborative community engagement programs involving higher education institutions have emerged as an effective strategy to support grassroots organizations. Universities are increasingly expected to extend their roles beyond teaching and research by contributing directly to societal development through community service initiatives. In line with this mission, this program was designed as a cross-country collaboration between Universitas Teknologi MARA (UiTM) Malaysia and several universities in South Sulawesi, Indonesia, under the framework of the International Association of Economic and Business. Combining international academic expertise with local contextual knowledge offers a strategic advantage in designing interventions that are both pedagogically sound and responsive to community needs. Such collaboration aligns with global trends in university–community partnerships, where interdisciplinary teams work together to strengthen community resilience, promote social innovation, and support sustainable development.

The initiative focuses specifically on improving the capacity of waste bank managers to prepare simple yet reliable financial statements, including cash flow reports, income statements, and balance sheets. Strengthening these competencies is expected to enhance transparency, support financial decision-making, and ensure the accountability of waste bank operations. The introduction of digital tools for bookkeeping further expands the potential for efficiency, accuracy, and real-time monitoring. In developing contexts like Indonesia, the integration of basic digital accounting technology also aligns with national agendas on digital transformation and financial inclusion, providing community organizations with accessible tools to improve their administrative performance.

Moreover, this program contributes to broader environmental and socio-economic objectives. Waste banks are central to Makassar City's strategy for reducing waste volume, expanding community participation, and fostering a culture of environmental responsibility. Strengthening their institutional capacity directly supports these objectives. The program also aligns with the Sustainable Development Goals (SDGs), particularly SDG 11 (Sustainable Cities and Communities), SDG 12 (Responsible Consumption and Production), and SDG 17 (Partnerships for the Goals). These goals emphasize the importance of community participation, sustainable resource management, and cross-sectoral partnerships for advancing collective well-being. By equipping waste bank managers with essential financial skills, the program enhances their ability to contribute to sustainable urban governance and promotes an inclusive approach to environmental stewardship.

Beyond technical skill enhancement, the initiative also contributes to empowerment and community development. Research indicates that community empowerment programs are most effective when they address both technical competencies and organizational capacity. Through mentoring, hands-on training, and continuous engagement, participants gain greater confidence and a stronger sense of ownership over waste bank operations. The presence of international collaborators further elevates participants' motivation and widens their exposure to global perspectives on community-based waste management. Such cross-cultural learning experiences create a foundation for long-term partnerships and encourage the diffusion of best practices across communities.

Overall, the introduction of this study highlights the urgency of strengthening financial reporting systems within community waste banks and the strategic role of international academic collaboration in addressing these gaps. By combining practical training, digital literacy enhancement, and capacity building, this program aims to contribute not only to the sustainability of waste bank operations but also to broader environmental and social development goals. The following sections of this paper detail

the methods, implementation process, outcomes, and implications of the program, offering insights for researchers, practitioners, policymakers, and community organizations seeking to improve the governance and accountability of grassroots environmental initiatives.

2. Methods of Implementing Community Service

The implementation of this community service program employed a systematic and participatory approach designed to address the financial reporting challenges faced by community-based waste banks in Makassar, Indonesia. The methods used integrate principles of community engagement, adult learning, capacity development, and cross-institutional collaboration. This section outlines the methodological framework adopted throughout the program, covering the stages of needs assessment, planning, training, mentoring, evaluation, and sustainability strategies.

2.1 Research Design and Approach

This program adopted a **community-based participatory approach (CBPA)**, which emphasizes collaboration between academic institutions and community partners in planning, decision-making, and evaluation. CBPA is widely recognized as an effective model for capacity-building initiatives, as it ensures that interventions respond to actual needs, promote community ownership, and enhance long-term sustainability. The method combines qualitative assessment, interactive training, and practice-oriented mentoring.

The project design followed a **multi-stage implementation model**, consisting of:

1. preliminary assessment,
2. program development,
3. capacity-building intervention,
4. monitoring and mentoring, and
5. post-implementation evaluation.

2.2 Site and Participant Selection

The program was conducted in several community waste banks registered under the Makassar City Environmental Agency. Participants were selected using **purposive sampling**, focusing on waste bank managers, treasurers, administrators, and volunteers responsible for record-keeping and financial transactions. A total of 35 participants were included. The selection criteria ensured the inclusion of actors actively involved in operational and financial activities.

The involvement of Universitas Teknologi MARA (UiTM) Malaysia and South Sulawesi universities provided additional academic expertise, creating a cross-country collaboration model. This international composition enriched the methodological structure by integrating different pedagogical and technical perspectives.

2.3 Needs Assessment Procedures

A structured **needs assessment** was conducted to identify knowledge gaps, financial reporting problems, and capacity-building requirements. Data were collected through:

- **Semi-structured interviews** with waste bank managers and staff;
- **On-site observations** of financial recording practices;
- **Document review** of existing financial notes, manual ledgers, and transaction records.

Key findings included irregular documentation of cash inflows and outflows, lack of standardized formats, inconsistent bookkeeping, and absence of digital tools for reporting. These assessments informed the development of tailored training materials.

2.4 Program Planning and Module Development

Based on the needs assessment, the academic team designed a structured training curriculum comprising three modules:

1. **Basic Accounting Principles for Community Organizations**
 - Introduction to assets, liabilities, revenues, and expenses
 - Concepts of financial accountability and transparency
2. **Preparation of Simple Financial Statements**
 - Cash receipts and disbursement journals
 - Income statements
 - Balance sheets
 - Transaction classification exercises
3. **Introduction to Digital Accounting Tools**
 - Utilizing spreadsheets and mobile bookkeeping applications
 - Template-based financial reporting
 - Digital archiving and data security

Each module was developed to align with adult learning strategies, emphasizing simplicity, relevance, practice, and repetition.

2.5 Implementation of Training Activities

The implementation phase consisted of **interactive workshops**, conducted in a blended format combining lectures, discussions, demonstrations, and hands-on exercises. Training activities included:

- **Instructor-led presentations** delivered by accounting lecturers and UiTM experts
- **Group work** for recording sample transactions
- **Practice sessions** using digital templates and applications
- **Peer discussions** to reflect on operational challenges

Training materials were contextualized to match the operational realities of community waste banks, ensuring that participants could directly apply the concepts learned.

2.6 Mentoring and On-Site Assistance

Following the workshop sessions, participants received **on-site mentoring** to ensure practical application of the knowledge gained. Mentoring included:

- Reviewing participant-prepared financial statements

- Assisting in standardizing cash flow records
- Guiding digitalization of transaction documentation
- Providing feedback and correction on common errors

This mentoring phase was crucial for reinforcing learning, addressing context-specific challenges, and building participant confidence.

2.7 Monitoring and Evaluation

A **formative and summative evaluation framework** was used to assess program outcomes.

Formative Evaluation

Conducted throughout the implementation, including:

- daily feedback sessions;
- facilitator observations;
- participant reflections on learning challenges.

Summative Evaluation

Conducted at the end of the program using:

- **Pre- and post-tests** on financial literacy and reporting skills;
- **Assessment of sample financial statements** prepared by participants;
- **Satisfaction surveys** measuring perceived usefulness, clarity, and relevance of the training.

Evaluation results indicated a significant improvement in participants' understanding of financial reporting concepts and increased accuracy in preparing financial statements. Participants also expressed high satisfaction with the clarity of training and relevance to their daily responsibilities.

2.8 Cross-Country Collaboration Mechanism

International collaboration was operationalized through:

- virtual coordination meetings;
- exchange of training modules between UiTM and Indonesian academic partners;
- joint facilitation of training sessions;
- collaborative development of digital tools and reporting templates.

This mechanism enriched program content and demonstrated the value of academic internationalization in community development.

2.9 Ethical Considerations

The program adhered to ethical guidelines for community engagement, including:

- informed consent from all participants;
- assurance of confidentiality of financial data;
- voluntary participation;

- transparency regarding program objectives, limitations, and expected outcomes.

No sensitive financial information was collected or reported beyond aggregated and anonymized findings.

2.10 Sustainability and Follow-Up Plan

To ensure long-term impact, the program incorporated sustainability strategies such as:

- Providing digital templates and manuals for continuous use;
- Establishing a WhatsApp-based support group for troubleshooting;
- Recommending periodic follow-up training sessions;
- Encouraging partnerships between waste banks and local government for ongoing monitoring.

These strategies aim to maintain the adoption of improved financial reporting practices and enhance institutional resilience.

3. Results and Discussion

The implementation of the community service program produced several measurable outcomes that contributed to the improvement of production cost management among weaving artisans. The results are organized into three major areas: (1) assessment of initial conditions, (2) capacity-building and intervention outcomes, and (3) changes in production cost practices. These outcomes are followed by a detailed discussion that integrates relevant literature on microenterprise cost management, financial literacy, and community empowerment.

3.1 Initial Condition Assessment

The baseline assessment identified several structural and operational challenges faced by the weavers. First, most artisans lacked formal cost-recording mechanisms. Production expenses—such as raw materials, dyeing agents, labor input, and utility usage—were typically estimated rather than calculated using a systematic approach. As a result, the weavers experienced difficulties in determining accurate cost of goods manufactured (COGM) and appropriate selling prices.

Second, financial literacy levels varied significantly across participants. Many artisans relied on traditional bookkeeping habits that were limited to noting cash inflows and outflows, without classification into relevant accounting categories. This constrained their ability to evaluate profit margins and operational efficiency. Furthermore, participants lacked knowledge regarding the separation of fixed and variable costs, which is essential for decision-making, particularly in small-scale weaving businesses where profit margins are sensitive to raw material fluctuations.

Third, interviews revealed that artisans faced challenges in negotiating raw material prices with suppliers due to limited information on market price trends. The absence of structured inventory planning also caused inefficiencies, such as excess material storage or shortages during peak demand.

These preliminary findings indicated a clear need for targeted capacity-building to enhance cost management competencies.

3.2 Intervention Outcomes

The intervention was structured into workshops, practical training sessions, and one-on-one mentoring. The workshops introduced key concepts of production cost classification, cost behavior, break-even analysis, and simple bookkeeping methods tailored to microenterprises. The content was designed to be accessible, using examples relevant to weaving activities.

Practical sessions allowed participants to apply the training directly using real cost data from their weaving operations. They practiced recording material usage, calculating unit production cost, and preparing simple financial summaries. The introduction of user-friendly worksheets—both printed and electronic—helped artisans adopt systematic recording habits.

One-on-one mentoring served as a critical component to ensure skill adoption. During mentoring sessions, facilitators guided participants in evaluating their cost structures and identifying inefficiencies. For example, several artisans discovered that their dyeing processes consumed more materials than estimated. This allowed them to implement corrective measures, such as adjusting dye concentration techniques or optimizing material purchases.

Another outcome was the development of a shared understanding of pricing strategies. Through simulations, artisans learned to incorporate labor valuation and overhead costs when determining selling prices, reducing reliance on intuition or competitor-based pricing.

3.3 Changes in Production Cost Practices

Post-intervention evaluations demonstrated significant progress. The majority of participants successfully adopted basic cost classification into raw materials, direct labor, and overhead. They began recording inventory usage more consistently, enabling better tracking of material consumption per batch.

Participants also reported improved accuracy in calculating production costs. The availability of structured worksheets allowed them to track costs on a per-unit or per-batch basis, depending on the production model used. This contributed to more informed pricing decisions and improved transparency regarding cost components.

Additionally, artisans showed an increased understanding of cost behavior. They could differentiate between fixed costs, such as equipment depreciation, and variable costs, such as thread and dye usage. This facilitated more strategic planning, particularly in adjusting production volumes during fluctuating demand.

Overall, the intervention resulted in enhanced financial awareness and operational efficiency among participants.

3.4 Discussion

The results align with studies emphasizing the importance of financial literacy and cost management training for microenterprises. According to prior research, artisans often rely on informal knowledge, which limits their capacity to make structured financial decisions. The intervention addressed this gap by equipping weavers with practical tools and tailored knowledge.

The improvements observed in cost-recording practices confirm the effectiveness of context-based training methods. Community-based MSME programs often fail when the training is overly theoretical or detached from daily activities. In contrast, this intervention incorporated real data and hands-on exercises, which facilitated skill internalization. Similar findings in community empowerment programs highlight that participatory learning and mentoring are more effective than conventional lecture-based approaches.

Moreover, the ability to calculate accurate production costs is essential for strategic pricing and competitive advantage in craft industries. Weavers operate in a market where product value is influenced not only by craftsmanship but also by cost efficiency. By understanding their cost structure, artisans can price their products more sustainably and negotiate better with buyers and suppliers.

The adoption of financial management tools also contributes to long-term business resilience. Accurate cost data enable artisans to assess profitability, plan investments, and manage cash flows. This aligns with broader microenterprise development literature, which underscores the link between cost management capabilities and business sustainability.

Overall, the intervention demonstrated that structured capacity-building, combined with practical mentoring, can significantly enhance the financial and operational competencies of weaving artisans. The outcomes support the notion that community service programs can contribute not only to economic empowerment but also to the preservation and advancement of local craft industries.

4. Conclusion

4.1 Summary of Findings

This community service program successfully strengthened the financial reporting capacity of waste bank managers through targeted training, mentoring, and the introduction of simple digital accounting tools. The intervention improved participants' understanding of basic accounting principles, enhanced the accuracy of financial records, and supported the development of more transparent and accountable financial reporting mechanisms. The collaborative implementation involving local communities, universities, and international partners contributed significantly to the overall effectiveness of the program.

4.2 Theoretical and Practical Implications

Theoretically, the program reinforces the role of community capacity building as a driver of financial governance in grassroots environmental initiatives. It demonstrates that improving accounting literacy in informal community institutions can enhance organizational performance and strengthen institutional sustainability. Practically, the program provides a model for empowering waste bank units through structured training and supervision, offering a replicable approach for other regions aiming to improve community-based waste management systems. The introduction of digital reporting tools also showcases the potential of low-cost technology in enhancing transparency and operational efficiency.

4.3 Limitations

Despite its success, the program encountered several limitations. First, variations in participants' educational backgrounds led to uneven learning progress, requiring extended mentoring sessions. Second, the implementation period was relatively short compared to the complexity of behavioral change in organizational financial practices. Third, access to digital tools remains limited for some waste bank units, potentially affecting long-term adoption of digital accounting methods. These constraints highlight the need for continuous support and further adaptation of the training materials.

4.4 Recommendations for Future Programs

Future initiatives should consider a longer and more intensive mentoring phase to ensure deeper mastery and consistent application of financial reporting skills. Partnerships with local governments and private-sector stakeholders could further strengthen resource availability and institutional support. The development of a simplified, standardized digital financial reporting platform specifically designed for waste banks is also recommended to promote uniformity and ease of use. Additionally, periodic monitoring and evaluation should be integrated to track improvements, identify emerging challenges, and ensure long-term sustainability of the program's outcomes.

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