



Multi-actor governance in a waste sorting and gold savings program: Insights from a MACTOR analysis

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ABSTRACT

Background: The Waste Sorting and Gold Savings Program (*Memilah Sampah Menabung Emas/MSME*) is an innovative waste-based initiative that integrates environmental objectives with financial inclusion and community economic development at the village level. Since the program involves multiple actors with different roles, interests, and levels of influence, its success depends on effective stakeholder collaboration. **Methods:** This study employed a qualitative case study approach at the Karangturi Berseri Waste Bank in Karangturi Village, Karanganyar Regency, Central Java Province. Data were collected through in-depth interviews, field observations, and document studies and were analyzed using the Matrix of Alliances and Conflicts: Tactics, Objectives, and Recommendations (MACTOR) method. **Findings:** The results indicate that the waste bank serves as the main implementing actor with high influence and dependence. Pegadaian and the village government occupy strategic positions by providing support and legitimacy. Convergence analysis demonstrates strong alignment among actors regarding community participation and financial inclusion, while divergence analysis reveals potential differences in interests related to program sustainability and waste market mechanisms. **Conclusion:** The sustainability of the MSME program depends on the ability of key actors to maintain collaboration, manage differences in interests, and balance social, environmental, and economic objectives. **Novelty/Originality of this article:** This study provides a stakeholder-based analysis of the MSME program using the MACTOR method, offering insights into actor influence, convergence, divergence, and collaboration dynamics in a community-based waste management and financial inclusion initiative.

KEYWORDS: inclusion finance; mactor; multi-actor collaboration; pegadaian; waste bank.

1. Introduction

Indonesia is experiencing an improvement in inclusive finance of approximately 67–79%, which is still lower compared to Singapore, Malaysia, and Thailand (Hidayat & Sari, 2022; Sahputri et al., 2024). The expected increase can reach all layers of the public, providing them with access, ability, and opportunity to use safe, affordable, and formal financial services in accordance with their needs. In fact, Indonesia is still faced with an unevenly distributed society. Access to accounts and credit remains concentrated in Java, Sumatra, and Bali, followed by Kalimantan and Sulawesi, with disparities also evident in the eastern region (Rumbogo et al., 2021; Sahputri et al., 2024). Obstacles include education and literacy, digital infrastructure, access to physical resources, cost, regulatory and institutional factors, as well as social and trust factors.

The low level of education and literacy causes reluctance to access public financial institutions, such as opening accounts, using e-banking, and accessing credit (Eka, 2023;

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Putra et al., 2024). Access to physical and cost factors is limited because accessibility outside Java remains very minimal; the number of banks and access to financial institutions is significantly less than in Java (Rumbogo et al., 2021; Saifurrahman & Kassim, 2021). The gap is wider due to the unstable differences in digital and internet access, which hinder the utilization of digital services, especially in vulnerable villages and groups (Astuti et al., 2025). Regulatory and institutional factors lead to an imbalance in the rules governing Islamic banking, taxes, and MSMEs registration, creating obstacles to inclusive financing. Meanwhile, social and cultural factors cause the public to face complicated procedures in service finances, leading to a further decline in public trust in institutional finance (Masnita et al., 2019).

PT Pegadaian is a non-bank State-Owned Enterprise (BUMN) that has been granted law-given authority to distribute credit based on pawn to society, suitable for both productive and consumptive needs (Febriyanti et al., 2025). Pegadaian helps prevent practice loan sharks with no interest and becomes an alternative funding source fast, with a simple procedure (Rinanda & Heni Saputri, 2021) through the pawn program classic, financing business, product gold, and investment (Mafiroh et al., 2025), as well as Sharia services (Sembiring et al., 2025) and digital services (Perdana et al., 2024). Pegadaian also strives to increase financial literacy through seminars, socialization activities, promotions in the field, and education via social media (Hidayatullah et al., 2024). One of the forms of education literacy financial done through the concept of "Gade Clean and Gold" through "*Waste Sorting and Gold Savings Program (Memilah Sampah Menabung Emas =MSME)*" which combines two ideas, namely savings gold at Pegadaian and the concept of saving the waste at the garbage bank fostered by PT Pegadaian (Karnawijaya et al., 2021).

The development of waste banks is a very strategic choice as a form of the Partnership and Community Development Program (PKBL) at Pegadaian, with reasons: (1) waste banks near in a way economy with daily life society ; (2) integrating literacy environmental and financial, (3) support sustainability sociopreneur, and (4) as mitigation behavior consumptive public medium to below (Witanti et al., 2024). The number of waste banks foster care Pegadaian has reached 425, with waste banks collected through the Forum Sahabat Emas Peduli Sampah Indonesia (FORSEPSI). The waste bank team becomes actors in key driving forces across the education, literacy, environmental, and financial sectors through MSME. The MSME initiative by Pegadaian is an innovative approach that integrates waste management with scheme inclusion finance through savings gold, thereby promoting a change in public behavior at a time of open access to formal financial services (www.forsepsipegadaian.id, 2025).

Ideally, education, literacy, and financial management carried out by the waste bank team to the community (supported by Pegadaian) can be characterized by: (1) intensive educational activities implemented ; (2) a reduced number of society members, and (3) an increase in waste bank customers and Gold savings customers. Unfortunately, complex field conditions result in gaps in educational achievements between waste banks within each region and across all classes. Evaluation conducted by Pegadaian, even with FORSEPSI limited to quantity activities, quantity of participant activities, as well as improvement in the number of customers. Practicing financial literacy is important for effective financial management, which is carried out annually and provides a strategic touchpoint for public, rural, and marginal communities. The implementation of this program involves collaboration with various actors who play different roles, have different interests, and wield varying levels of influence, so its success is primarily determined by the harmony of relationships and the dynamics of collaboration established. Therefore, understanding the structure of actors and patterns of interaction among them in MSME has become crucial for formulating effective education, literacy, and financial literacy programs. Actor-Network Theory (ANT) views reality as the social outcomes of network relations between actors, human and non-human, which are negotiated to obtain social benefits (Aka, 2025; Yao & Liu, 2022).

Based on this background, this research aims to analyze multi-actor collaboration in implementing the Waste Sorting and Gold Saving program (Memilah Sampah Menabung Emas), with Pegadaian as a key actor in strengthening people's economic resilience. This research employs the MACTOR approach (Matrix of Alliances and Conflicts: Tactics, Objectives, and Recommendations) to map actors, identify the primary objectives, and analyze the potential convergence and divergence of interests among inter-factors. Thus, research can contribute empirically and methodologically to the development of policies and practices for collaborative, public-based programs in sustainable finance and financial literacy.

2. Methods

2.1 Research design and study location

This study used a qualitative approach with a descriptive case study approach that was chosen to gain a deep understanding of the dynamics of multi-actor collaboration in the implementation of the Waste Sorting and Gold Saving Program (MSME) at the village level, as well as to provide a contextual understanding of the social, institutional, and economic aspects surrounding program implementation.

The research location was purposively selected at the Karangturi Berseri Waste Bank in Karangturi Village, Gondangrejo District, Karanganyar Regency, Central Java Province, as one of the locations for implementing the MSME program. As of 2022, this waste bank has been developed as a Pegadaian-assisted waste bank and is expected to fully implement the MSME program by 2025. The selection was based on its early experience in program implementation, network formation, and stakeholder involvement. Through the MSME program, the waste bank has successfully educated around 332 participants, with 64 of them becoming gold savings customers.

The subjects of this study included actors involved in the program, namely Pegadaian as facilitator, the village government as local regulator, the waste bank as the leading implementer, community leaders as local opinion leaders, community members as direct beneficiaries, educational institutions as indirect beneficiaries, and waste off-takers as market intermediaries.

2.2 Data collection and validation

Research data sources consisted of primary and secondary data. Primary data were obtained through in-depth interviews with key actors, field observations during program implementation, and reviews of internal program documents. Meanwhile, secondary data were obtained from documentation and reports related to MSME activities, including socialization materials and program implementation reports.

To ensure the validity and credibility of the findings, this study employed data and method triangulation. Triangulation was conducted by comparing and confirming information obtained from various sources, including interviews, field observations, and program documents. Interviews were conducted with key actors involved in the program, including Pegadaian, waste bank managers, village government representatives, community leaders, and community members to explore their perceptions, interests, and roles. Field observations were used to understand the actual implementation of the program, particularly in relation to waste management and gold-saving mechanisms. Program documents and activity reports were also used to strengthen contextual understanding and verify the consistency of information obtained from other sources.

2.3 Data analysis

Data analysis was carried out through several stages. First, descriptive analysis was employed to describe the program context, the roles of actors, and the patterns of interaction that emerged during implementation. Second, the study applied the Matrix of Alliances and Conflicts: Tactics, Objectives, and Recommendations (MACTOR) method to map inter-actor relations based on their level of influence and importance in achieving program objectives. The MACTOR approach was selected because of its ability to systematically identify potential convergence and divergence of interests among actors involved in the program.

The qualitative data analysis process followed Miles and Huberman's interactive model, which consists of data reduction, data display, and conclusion drawing and verification. In the data reduction stage, data obtained from interviews, observations, and documentation were selected, coded, and simplified according to the focus of the study. In the data display stage, the reduced data were presented in the form of analytical narratives, actor-role tables, and visualizations of MACTOR results, including influence-dependence maps, convergence and divergence analyses, and actor-objective relationships. The final stage involved drawing and verifying conclusions through continuous interpretation, triangulation, and iterative analysis to ensure the reliability and consistency of the findings in explaining the role of multi-actor collaboration in promoting rural financial inclusion.

3. Results and Discussion

3.1 Implementation of the MSME program

Waste Sorting Saving Gold (MSME) becomes the mainstay of the waste bank movement, fostered by PT Pegadaian, which is incorporated into FORSEPSI. The activity theme changes annually, tailored to the main points raised each year. For example, in 2024, the theme is "Golden Waste for Indonesia," while 2025 features the tagline Clean Indonesia Movement Program (*Gerakan Edukasi Indonesia Bersih*= GEIB) with the theme "Together with FORSEPSI, a Clean Indonesia." Based on the book of GEIB 2025 Guide, the Clean Indonesia Education Movement Program is an initiative competition for internal education at Waste Bank PT Pegadaian, fostering FORSEPSI members to increase literacy, environmental awareness, and financial literacy through the campaign "Waste Sorting Saving Gold," which supports the government's vision in Clean Indonesia 2045. This program will be implemented at the FORSEPSI work area level, under the Waste Bank category, in collaboration with the Central and Unit Waste Banks. The waste bank that participates registers itself and receives financial assistance of Rp. 1,000,000.00 (for central waste banks), and Rp. 750,000.00 (for unit waste banks) each month by conducting a minimum of 4 education sessions (minimum 160 participants/month). Activities in education were conducted for 3 months (September-November 2025), where the waste bank that did not meet the target would be discontinued and could not continue into the next month. Rules differ from previous years, as the implementation is more flexible and easier to administer. It is also supported by an active web system that informs participants about the education they have received, who joins and becomes a customer, and the evaluation and understanding of their education. Competition implemented within the framework gives appreciation to every active waste bank and provides literacy and financial support to the community. The group's target is chosen based on the group's public in the local community/village. To make things easier, implementation activities such as Empowerment Welfare Family (PKK), Women Farmer Groups, Neighborhood Associations, schools, and similar groups are considered.

The Pegadaian Team provides education, socialization, and financial literacy to all waste bank administrators. This includes opening communication and fostering networking, as well as inviting the public to participate in using waste as an economic

instrument for a circular economy. This MSME program give benefit in the form of ; (1) economic; helping overcome problem waste and the environment; (2) economy/finance; society that previously no touched service finance start understand and have savings gold as instrument investment ; (3) Social; increase awareness, participation, and capacity social community in management waste and literacy finance ; (4) program governance; improving awareness, participation, and capacity social community in management waste and literacy finance (Karnawijaya et al., 2021; Pertiwi et al., 2020; Tiyarna et al., 2024). Profit is not only for Pegadaian and waste banks, but also for the community that participates in the educational process (MSME program). The community that has educated and strengthened his understanding has become an opportunity for him to join as an MSME waste bank customer through customer vouchers, which are new ones provided by Pegadaian through the waste bank. Therefore, the activity of MSME education at this time has evolved into a sustainable green economy program.

MSME in 2025 is participating in the first waste bank, Karangturi Berseri, following its membership with FORSEPSI. Confusion in determining the group target education, packaging activity education, and closing activities creates a constraint for the waste bank administrator when initiating activities. The FORSEPSI WhatsApp Group (WAG), which shares and discusses MSME activities, serves as a constructive source of passion and inspiration for waste bank administrators. Finally, the waste bank administrator can compile a plan for the selected group, arrange the educational timetable, and close and compile the monthly report. Collaboration with the government village and figures society (opinion leaders) succeeds in utilizing regular meeting forums to intersperse educational activities. Plus with collaboration together officer from PT Pegadaian who participated down to the field really helps the education process literacy financial through the MSME education program by the waste bank Karangturi Berseri succeed give education to 332 people, and invited 18 customers the previous beginning is non- gold savings customers switch to gold savings, as well as add gold savings customers new as many as 46 people. These achievements are commendable compared to those of other waste banks that have successfully educated large numbers. However, it is still getting minimal gold savings customers. Unfortunately, the Waste Bank Karangturi Berseri was only able to follow education until October (2nd period) due to negligence in uploading the report for the second month of implementation. Challenge main gives education literacy rural finance faced with circumstances ; (1) conditions are low start: education is low income limited, and far from financial institutions, or institutions with existing finances are not friendly to the public villages (Azeez & Banu, 2021; Twumasi et al., 2022) Many inhabitant villages did not yet understand basic budgeting, savings, emergencies, interest, risk, and planning for retirement/old age (Czech et al., 2024) Women, small farmers, and low-income households tend to be the most lagging (Akande et al., 2023)(2) digital and fintech challenges: lack of internet access and low digital literacy (Zaman et al., 2024)(3) Social culture believes in informal financial institutions (Sahu et al., 2025); and (4) literacy, financial education, is not taught in rural areas (Gremi et al., 2024).

3.2 Structure collaboration and multi-actor roles in MSME

Based on experience from the Waste Bank Karangturi Berseri, it can be observed that actors and their roles are necessary for the MSME program to succeed, as shown in Table 1. Implementation of the MSME program involves various actors with distinct roles and contributions. Pegadaian plays a role as a strategic facilitator, providing support financing, system savings gold, program assistance, and assigning field staff to help the waste bank team. Government villages serve as local regulators, providing legitimacy and support for policies at the village level, thereby facilitating actual activities. This makes it easier for waste bank administrators to reach out to community leaders to plan educational activities. Waste bank administrators play a key role as the primary implementers and persons in charge of delivering MSME education, operating daily, as well as program drivers in the

field. Figures publicly function as opinion leaders, providing social legitimacy and encouraging citizen participation. Local communities become the direct recipients of benefits as participants in active programs, while educational institutions (Elementary School) play a role as recipients of benefits, without direct involvement, through strengthening the educational and awareness environment. In addition, the presence of waste off-takers functioning as market intermediaries ensures waste absorption while maintaining stability, prices, and value in the economy's waste management. Actors in the overall ecosystem play a role in accordance with their respective tasks.

Table 1. Actors and their roles in MSME activities

Actor	Role	Field action
Pegadaian	Strategic facilitator	providers, systems savings gold, MSME support
Village Government (VG)	Local Regulator	Legitimacy, support the village policy
Waste Bank (WB)	Main Implementer (Implementing Actor)	MSME education, operations, program drivers
Local Community Leader (LCL)	Opinion Leader	Legitimacy, social & mobilization
Local Community (LC)	Beneficiary	Participants & recipients benefit directly
School	Indirect Beneficiary	The recipient benefits from education
Waste Off-taker	Market Intermediary	Buyer, the deciding price, and the stability of the economy

The involvement of multiple stakeholders creates varying levels of influence and dependence within the program. An analysis of these relationships is important to understand how collaboration is formed among actors. Furthermore, based on their roles in the field, the weight of each actor influences different functions (Fig. 1), so that the positions of each actor influence and interact with one another, and the dependence between actors differs (Fig. 2). These findings provide an overview of the strategic positions occupied by each actor in supporting program implementation.

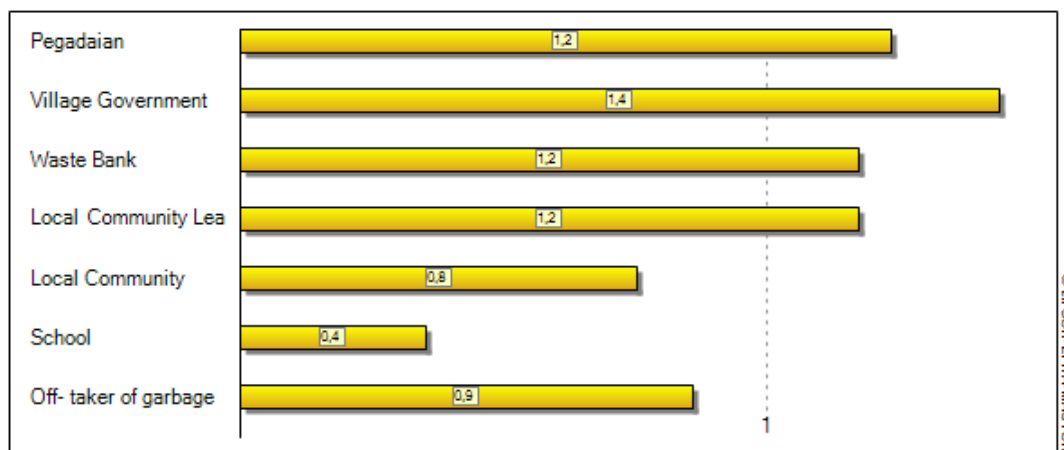


Fig.1. Actor power in MSME

The map of influence and dependency inter-actor shows a structure of asymmetric collaboration in the implementation of the MSME program. The waste bank occupies a position of mutual influence and high dependence, reflecting its role as a key actor during implementation, which is greatly influenced by the support of other actors. Pegadaian and the government village are located in a quadrant with relatively strong influence and low dependence, indicating a strategic position for both as actors and providers of program legitimacy. Figures in public life occupy a position of influence, straddling a middle and

dependent medium, affirming their role as opinion leaders who contribute to social mobilization. However, he still relies on the program's structure. On the other hand, the community's local and institutional education falls within the quadrant with low dependence height and influence, representing a position as a recipient of the main program. The waste off-taker occupies a position with relative influence and dependence that is low to medium, reflecting its role as an important market intermediary for the stability of the market economy, but not in a way that directly determines the direction of program policy.

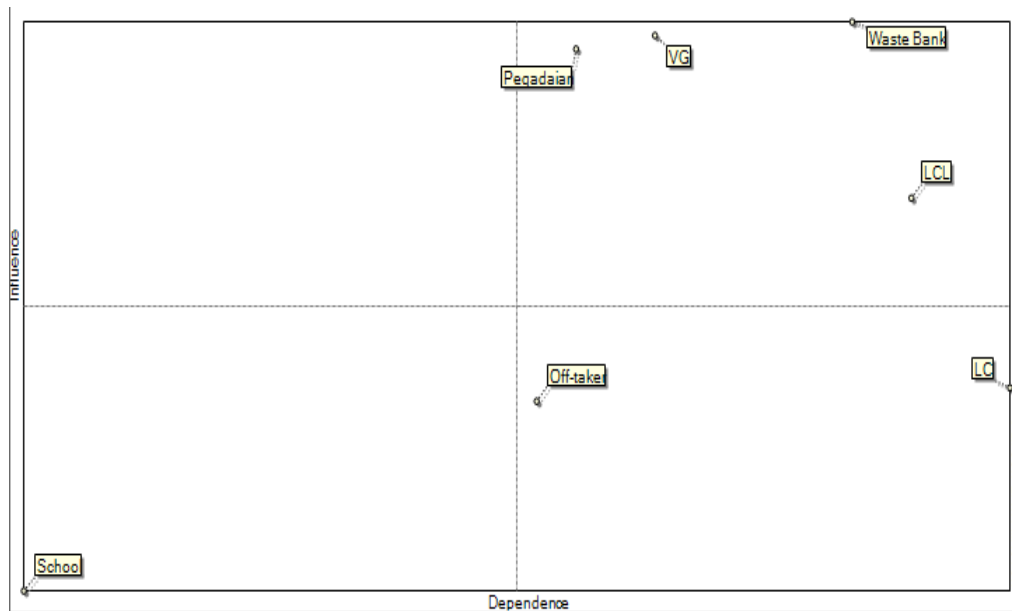


Fig. 2. Map of influence and dependence between actors in MSME

3.3 Objective in the MSME program

Based on the output of actors' mobilization towards its objective (Figure 3), the results of the MACTOR analysis show that, in a way, actors' own level of mobilization and alignment with the big MSME program objectives are high. Objectives in the improvement of participation, active public involvement in management and sorting rubbish, as well as improvement of literacy and inclusion in finance through the scheme savings gold, which reflects the existence of a strong consensus among inter-actors to orient social and empowerment programs. Objective sustainability economics and operations of waste banks, as implemented by these entities, also show high levels of agreement, indicating the importance of collective awareness and the need to strengthen local institutions to ensure program continuity. Meanwhile, objective guard stability and certainty mark the economy as lacking in market access and off-taker involvement, indicating a relatively small level of disagreement compared to others. This suggests that differences in interests or perceptions regarding inter-actor market mechanisms and price determination render the economy subpar, leading to excessive involvement of garbage off-takers. Many individuals choose to sell their trash directly to the off-taker, allowing them to receive the money they have earned. If the off-taker is limited to a waste bank, the public can sell their waste only to that bank, and the proceeds are deposited into a Gold savings account. The existence of a waste bank will restrict access to mobile off-takers. (van Leeuwen & Surya, 2024) Moreover, it potentially leads to the formation of a business group community (Budiyarto et al., 2025). The number of waste banks in Indonesia overall reached 5,244 (Khairunisa & Safitri, 2020); however, new contributions account for 7% of waste recycling management (Budiyarto et al., 2025). Regarding the strengthening of legitimate social and support institutions at the village level, there is still positive support, although not as high as that for objective

participation and financial inclusion. These findings indicate that, although there are differences in certain aspects of interest, the structure of collaboration among actors tends to converge overall on the program's primary objective.

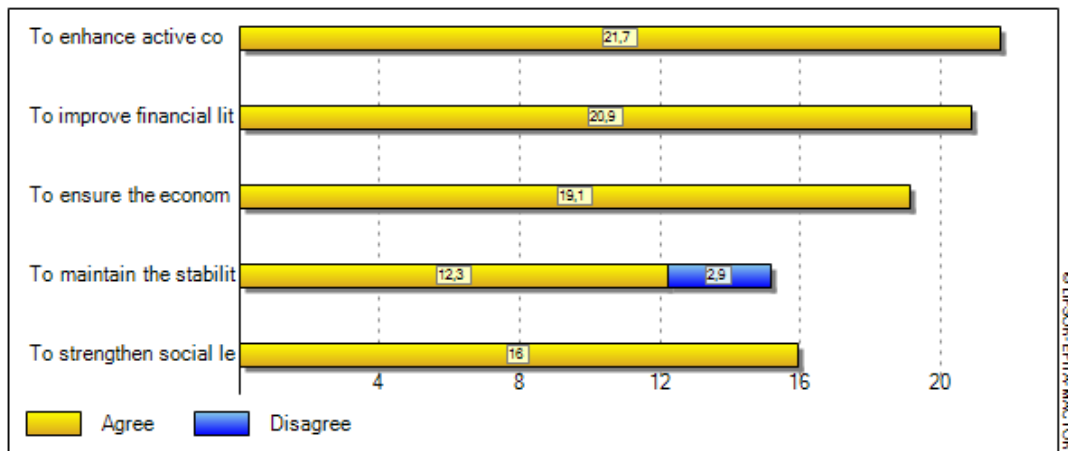


Fig. 3. Level of actor interest in the MSME program

This study confirmed that the success of the MSME program is primarily determined by its effectiveness. Multi-actor collaboration in a governance framework is collaborative. The structure identified influences and dependencies through the MACTOR analysis, revealing that actors with strong influence, such as Pegadaian and the government village, play a crucial role in shaping the program's direction and legitimacy. At the same time, the waste bank occupies a strategic position as the implementer, serving as a key connector between community-level policies and practices. The height level convergence actor to objective participation, community, and inclusion finance indicates a strong interest in objective social programs, in line with the perspective of inclusion finance, which emphasizes expanding access and utilization of financial services. However, there are differences in perceptions regarding the aspect of stability in the market economy, which shows that market dimensions in program-based communities still need a more coordinated and adaptive mechanism. Thus, the results strengthen the argument that effective multi-actor collaboration depends not only on the similarity of goals but also on actors' abilities to manage differences of interest institutionally and sustainably. Strengthening waste bank services by following up on the education implemented is crucial to enhancing the public's understanding and encouraging more action. Literacy is a significant barrier to financial inclusion for inhabitants of rural villages (Akande et al., 2023; Gallego-Losada et al., 2024). Education through MSME has the opportunity to promote the achievement of the objective of financial literacy in rural areas, which is both welfare-oriented (Panakaje et al., 2023; Popli, 2023) and sustainable for small businesses (Kyeyune & Ntayi, 2025).

3.4 Level of influence and dependence of the inter-actor in MSME

The chart of clean inter-factor distance (Fig. 4) illustrates the level of proximity and the difference in the position of the interest inter-actor in implementing the MSME program. The relative distance between Pegadaian, government villages, and waste banks indicates the existence of proximity interests as well as high-intensity interactions in program management and implementation. On the other hand, a greater distance between the waste bank and the community highlights a gap in the roles of the actor implementer and the recipient of benefits, indicating the need for a more effective mechanism for communication and support to ensure that the program objectives are optimally understood and internalized by the community. Schools and figures in the public sector should be in a

position to provide medium- to long-term support as connectors for social and educational roles within the program. Meanwhile, the off-taker's involvement shows a relatively distant relationship compared to the core actors, indicating a functional, market-oriented nature, but not yet fully integrated into the structured program collaboration. Findings. This confirms that strengthening collaboration depends not only on the level of influence of actors but also on the closeness of relational influences to the effectiveness of program coordination and sustainability.

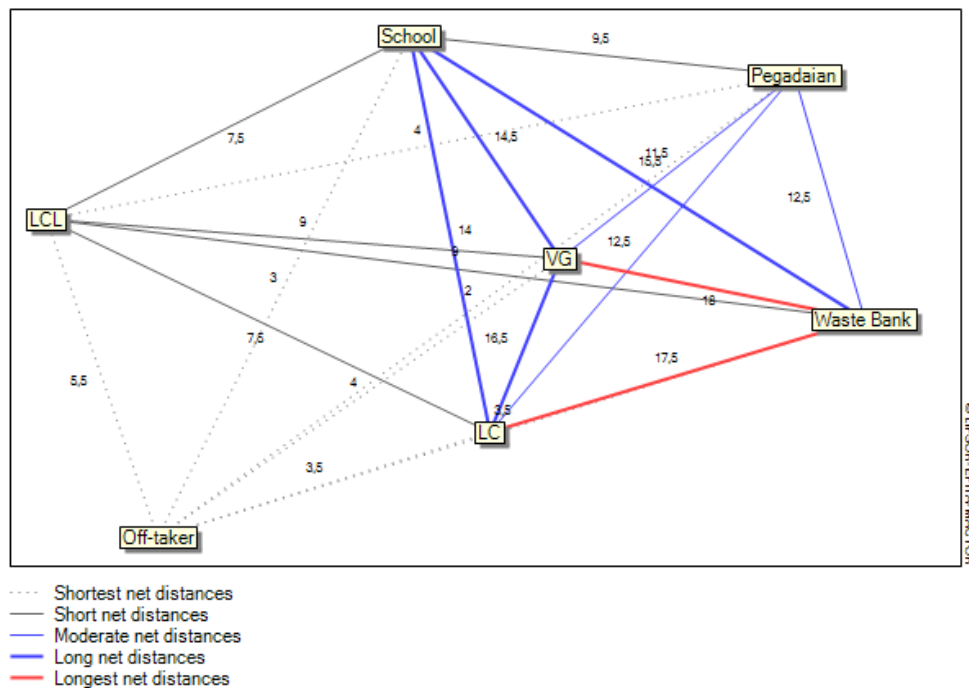


Fig. 4. Distance between actors in the MSME program

In a way, the overall results analysis structure, which influences dependence, mobilization, and distance between actors, indicates that multi-actor collaboration in the MSME program tends to converge on the social main goal, particularly in terms of community participation and financial inclusion. However, variations in relational inter-actor distance indicate that harmony interests at the level of the actor are not always directly compared with the similarity orientation toward all program objectives. Differences in proximity among actors, particularly between implementers, beneficiaries, and market actors, can influence priorities and interpretations in achieving specific objectives, such as stability, a market economy, waste reduction, and operational sustainability. Therefore, for a greater understanding and comprehensive analysis of program dynamics, analysis needs to continue at a distance, interobjectively, to identify the degree of closeness, consistency, and potential tension among program objectives within a multi-actor collaboration framework.

The chart of inter-objective distance (Fig. 5) illustrates the level of proximity and the difference in objective orientation during the implementation of the MSME program. Objective improvement participation in the community and strengthening legitimacy through social, educational, and financial aspects, which indicates the existence of strong relatedness between social, educational, and financial dimensions in the framework of people's rights. On the other hand, the objective sustainability of waste banks' economics and operations reveals a further distance from objective participation and social legitimacy, indicating that the institutional and operational aspects need to approach policies and resources in a different manner. The longest distance appears to be between objective stability and the economy's reliance on market mechanisms, as well as some objective social aspects, which reflects a potential tension between market logic and the community's

orientation towards empowerment. These findings confirm that although program objectives generally support one another, there are differences in orientation among objectives that need to be managed strategically to maintain the program's overall consistency and sustainability. This pentahelix model from MSME in Karangturi describes the relationship between actors and between capable interests, synergizing with a balanced power relationship. In this condition, it is thus necessary to guarantee its sustainability through a formal multi-stakeholder forum with explicit action carried out (Rini et al., 2021), recognition of formal roles carried out by waste banks, communities, and off-takers (Fatmawati et al., 2022), as well as a character leader facilitative (not bureaucratic) that builds trust and shares roles (Tan et al., 2025).

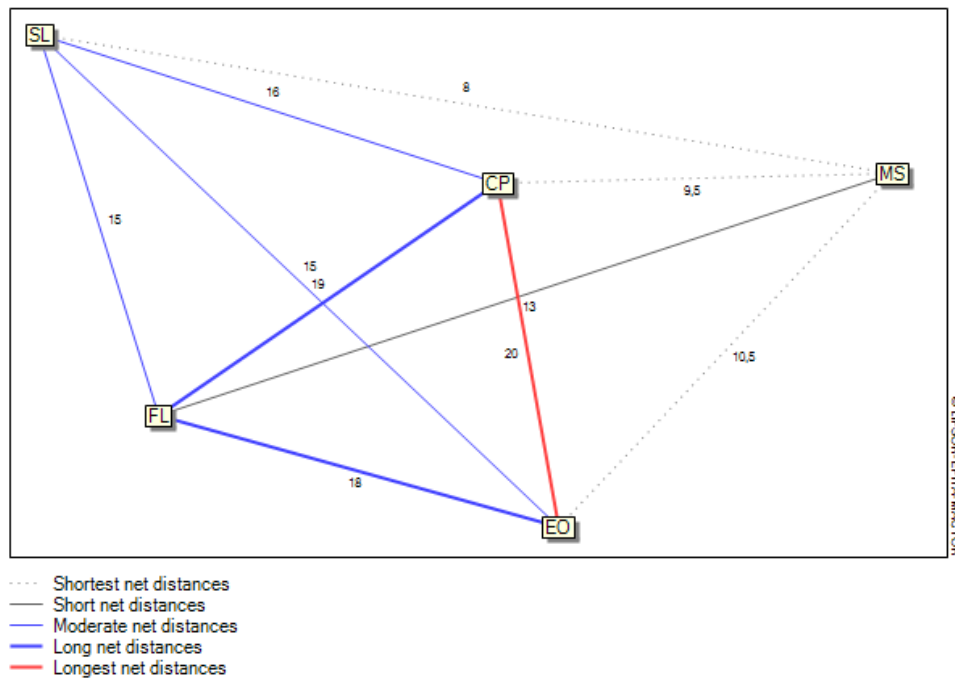


Fig. 5. Distance between objectives in the MSME program

Analysis of the distance between actors and the distance between objectives provides insight into the structural connections and the level of proximity between actors and goals in program implementation. Although the closeness structure is not yet fully explained, the actors' own orientations, aligned interests, or the precise ways potential differences in achievement program objectives are shown. Therefore, for a deeper analysis of the dynamics of interactions and interests between actors, as well as the relatedness between objectives, the discussion is further directed at analyzing convergence and divergence. Analysis. This becomes important for identifying level harmony, potential conflicts, and space negotiations that affect effective collaboration and program sustainability.

3.5 Patterns of Harmony (Convergence) and Conflict (Divergence) between actors in MSME

Fig. 6. Illustrates the actor's level of interest in achievement program objectives. The convergence map indicates that the waste bank exhibits the strongest convergence with the government village (VG) and the community (LC), as evidenced by the thick red and blue lines, respectively, which signify high similarities in objectives, operational programs, sustainability, and economic program implementation at the local level. Strong convergence also exists between waste banks and schools, as well as between government villages and schools, reflecting harmony in education, social legitimacy, and environmental awareness. Meanwhile, Pegadaian shows moderate convergence with a prominent key actor, suggesting a relatively strategic role in harmony. However, more systemic nature

supporters are compared to operational directly. On the other hand, off-takers tend to be at a level of convergence with other actors, indicating a greater orientation towards specific market interests and the value aspects of the economy, as well as a more instrumental involvement. Overall, pattern convergence confirms that the core of program collaboration lies in the relationships between waste banks, the government, villages, and communities. At the same time, other actors play roles as amplifiers or supporters, with varying levels of alignment. It is emphasized that high convergence shows potential for a coalition and synergy in policy /strategy (Koura et al., 2024).

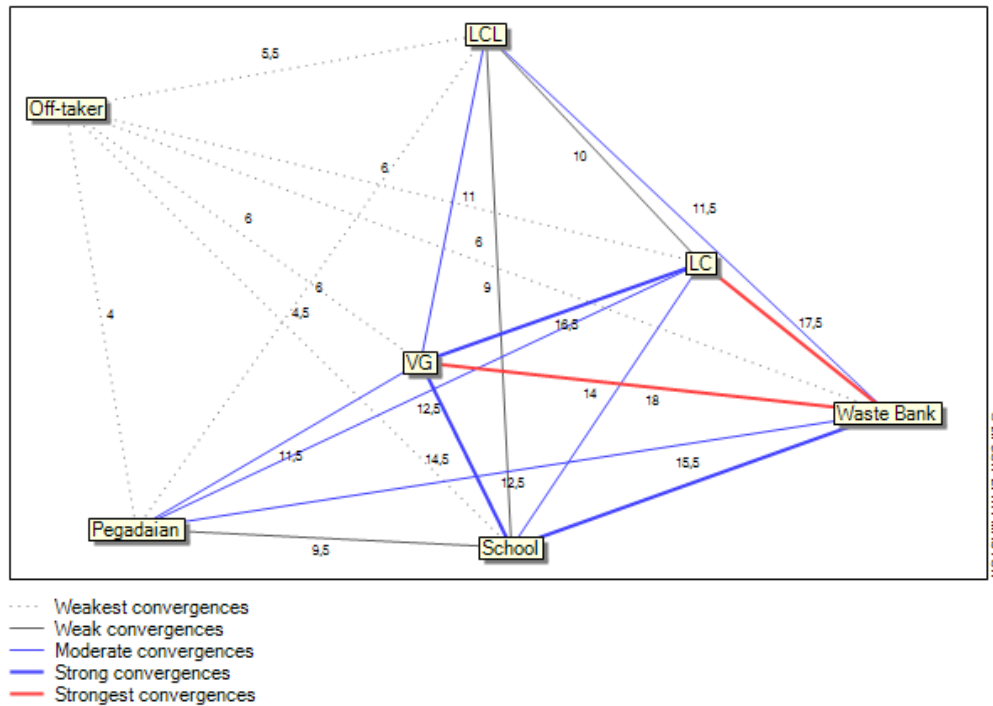


Fig. 6. Potential convergence between actors in MSME

Based on the findings, the inter-actor stated that it is essential to examine the other side of the dynamic relationship, specifically the potential for differences in interests and a lack of goal synchronicity, which can impact program sustainability. However, as part of a large-scale actor show of relative harmony, strong pattern convergence does not necessarily eliminate the existence of distance, interests, orientation, and priority inter-factors. Therefore, analysis of divergence becomes relevant to identify actors with different objectives, potential latent tensions, and areas of relationships that require mechanisms of coordination and adjustment to carry out.

Based on map divergence between actors, it is evident that potential differences in interests and orientations are reflected in the strongest goal, which appears in the relationship involving the Waste Bank, Local Community (LC), and Local Community Leader (LCL). The red line connecting the Waste Bank - LCL and the Waste Bank - LC shows the highest level of divergence, indicating differences in perception or priority between the actor implementer and the actor social at the community level. Divergence is also substantial between the Off-taker and LC, reflecting a related latent tension in the interest economy, particularly regarding the determination of price waste and its stability. A potential conflict between the off-taker and the waste bank and LC arises in determining the types and prices of waste (the waste bank and LC hope to secure a price higher than the off-taker's). However, the off-taker offsets this, and the result is agreed upon based on market price mechanisms. A potential conflict between LCL and the waste bank arises because activity education involves meeting people with limited time. Meanwhile, Pegadaian and the

Village Government (VG) tend to exhibit a moderate level of divergence, indicating that although there are differences of interest, their relationship is relatively more aligned and controlled. As for the school being in a position of weakest divergence, indicating more passive involvement and minimal conflict of interests. In terms of the overall map, this confirms that the main challenge in MSME collaboration lies in aligning the interests of actors' operational economics and their social communities, given their divergence. No development leads to conflict that hinders program sustainability. There are obstacles to implementing a potential program that can become a conflict, which needs to be approached/anticipated through effective communication (Winardi, 2019).

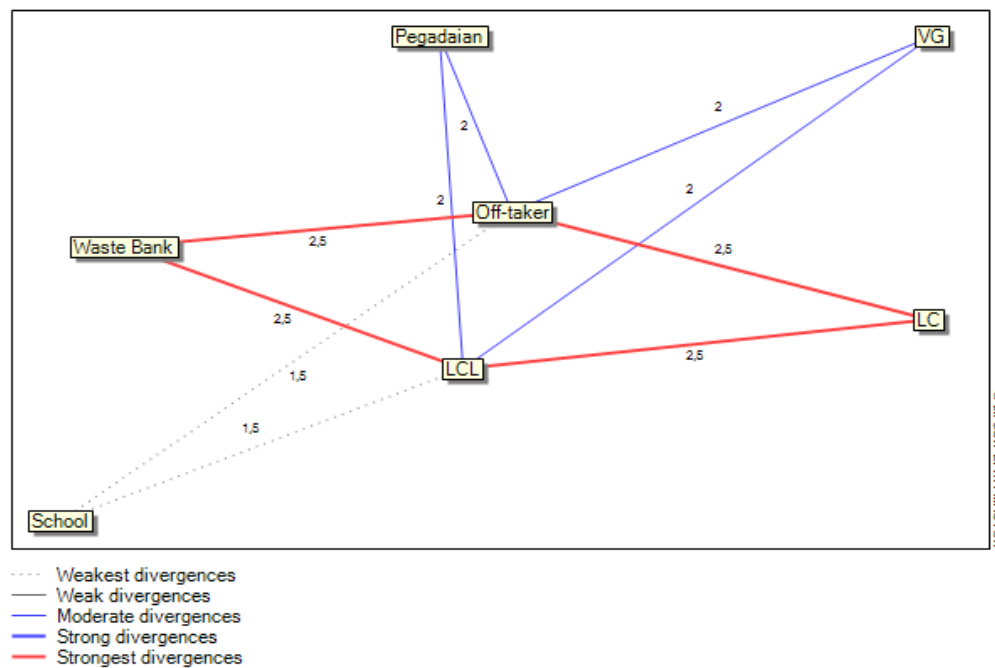


Fig. 7. Potential divergence between actors in MSME

In a way, the whole series of MACTOR analysis, which includes mapping influence and dependence of actors, mobilization of actors to the objective, the distance between actors, and the pattern convergence and divergence, shows that implementation of the MSME program is underway in a complex multi-actor collaboration framework, however, relatively consolidated. Waste bank appears as a non-operational entity. The main one is at the intersection of social, institutional, and market interests. At the same time, Pegadaian and the government village play a strategic role in providing legitimacy, system, and direction for policy. The convergence of actor-to-objective participation, community, and inclusive finance confirms the social program orientation. However, analysis divergence reveals potential tensions in aspects of the market economy, waste, and market relations with off-takers. These findings confirm that the success and sustainability of MSMEs are not only determined by shared goals but also by actors' ability to effectively manage distance-related relational issues, align diverse interests, and build mechanisms of adaptive coordination. Thus, the analysis provides strong empirical evidence on the effectiveness of multi-actor collaboration and its implications for strengthening inclusion, finance, and economic democracy at the village level through the MSME program.

4. Conclusions

This study demonstrates that Waste Sorting and Saving Gold (MSME) is a form of multi-actor collaboration that plays a crucial role in integrating waste-based public initiatives with efforts to improve inclusion, finance, and economics at the village level. The results of

the MACTOR analysis revealed that the success of the program is supported by the role of strategic Pegadaian and the government village as actors, directors, and providers of legitimacy, as well as waste banks as implementers, the main thing that becomes a connector between policies, education, and practices in the field. The high harmony between actor and objective participation in society and literacy finance confirms the orientation of social programs. At the same time, differences of interest arise in a market economy, highlighting the need for better management of market relations. Thus, the effectiveness and sustainability of MSMEs are not only determined by the similarity of objectives among actors, but also by their collaborative capabilities to manage differences of interest, strengthen coordination, and maintain balance between social and economic objectives.

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Author Contribution

All authors have equally contributed to the conception, writing, and revision of this article, ensuring its accuracy and integrity. E. R.: contributed to the development of research concepts and design, field interviews and observations, data narration, as well as the preparation of the article manuscript. T. K. N.: contributed to administrative tasks, data processing, and interpretation. F. W.: contributed to data collection, template preparation, administration, reference tracing, and plagiarism checks.

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Ethical Review Board Statement

Ethical review and approval were not required for this study as it involved minimal risk to participants, focused on program implementation and institutional roles, and did not collect any personally identifiable information. Informed consent was obtained from all participants prior to data collection.

Informed Consent Statement

Informed consent was obtained from all participants prior to data collection, and they were informed of the study's purpose and the voluntary nature of their participation.

Data Availability Statement

The data presented in this study are not publicly available due to ethical considerations and to protect participants' privacy; however, they are available from the corresponding author upon reasonable request.

Conflicts of Interest

The authors declare no conflict of interest

Declaration of Generative AI Use

The authors used generative AI tools solely for language editing and improvement of manuscript readability. All scientific content, data analysis, interpretations, and conclusions were developed and verified by the authors, who take full responsibility for the content of this manuscript.

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