

## Strengthening the Business Management of Cattle Waste Compost Fertilizer in Tanjung Karang, Malaysia


Supiah Ningsih<sup>1</sup>, Jufrizen<sup>2</sup>, Muhammad Irfan Nasution<sup>3</sup>, Sabrina<sup>4</sup>, Nor Bakhriah Sarbani<sup>5</sup>

<sup>1,2,3,4</sup>Universitas Muhammadiyah Sumatera Utara, Indonesia

<sup>5</sup>Universiti Teknologi MARA, Cawangan Selangor Kampus Puncak Alam, Malaysia

E-mail: 2430030026\_supiah@pelajar.umsu.ac.id

\*Corresponding Author

 <https://doi.org/10.31004/jerkin.v4i4.6053>

### ARTICLE INFO

#### Article history

Received: 22 Maret 2026

Revised: 28 Maret 2026

Accepted: 8 April 2026

#### Kata Kunci:

KUR Syariah, Pembiayaan  
UMKM, Perbankan  
Syariah

#### Keywords:

Sharia KUR, MSME  
Financing, Islamic  
Banking



### ABSTRACT

Program Pengabdian kepada Masyarakat (PKM) ini dilaksanakan untuk memperkuat manajemen usaha pupuk kompos berbahan limbah ternak sapi di Tanjung Karang, Malaysia. Program ini dilatarbelakangi oleh fakta bahwa meskipun kotoran sapi memiliki potensi besar untuk diolah menjadi pupuk organik bernilai tambah, kelompok mitra masih menghadapi berbagai tantangan utama dalam pengelolaan usaha, seperti lemahnya perencanaan bisnis, keterbatasan organisasi produksi, administrasi keuangan yang belum memadai, kualitas pengemasan yang rendah, serta kapasitas pemasaran yang masih terbatas. Tujuan PKM ini adalah meningkatkan kapasitas manajerial kelompok mitra agar kegiatan pengomposan dapat berkembang menjadi usaha berbasis masyarakat yang lebih terstruktur, produktif, dan berkelanjutan. Program ini menggunakan metode partisipatif dan berbasis pemberdayaan yang meliputi tahapan identifikasi awal, pelatihan, pendampingan, serta evaluasi. Kegiatan yang dilaksanakan mencakup pelatihan manajemen usaha, pendampingan pembukuan sederhana, penguatan organisasi produksi, peningkatan pemahaman mengenai pengemasan dan pelabelan produk, serta pengenalan strategi pemasaran dasar. Hasil kegiatan menunjukkan bahwa program PKM ini berkontribusi dalam meningkatkan pemahaman peserta mengenai manajemen usaha, memperbaiki organisasi produksi, memperkenalkan praktik pencatatan keuangan sederhana, meningkatkan kesadaran terhadap pentingnya pengemasan dan branding produk, serta memperluas wawasan pemasaran. Selain itu, program ini juga mendorong masyarakat untuk memandang limbah ternak tidak hanya sebagai masalah pembuangan, tetapi sebagai sumber daya ekonomi lokal yang bernilai. Secara keseluruhan, PKM ini menunjukkan bahwa penguatan kapasitas manajerial merupakan faktor kunci dalam mentransformasikan kegiatan pengomposan berbasis masyarakat menjadi usaha lokal yang lebih berkelanjutan dan kompetitif. Pengalaman ini juga memberikan model praktis dalam mengintegrasikan pengelolaan lingkungan, kewirausahaan, dan pemberdayaan masyarakat pedesaan.

This Community Service Program (PKM) was conducted to strengthen the management of a cattle waste compost fertilizer enterprise in Tanjung Karang, Malaysia. The program was motivated by the fact that, although cattle manure has strong potential to be converted into value-added organic fertilizer, the partner group still faced major challenges in business management, including weak business planning, limited production organization, inadequate financial administration, poor packaging, and limited marketing capacity. The objective of this PKM was to improve the managerial capacity of the partner group so that the composting activity could develop into a more structured, productive, and sustainable community-based enterprise. The program employed a participatory and empowerment-based method consisting of preliminary assessment, training, mentoring, and evaluation. The activities included business management training,

assistance in simple bookkeeping, strengthening of production organization, improvement of packaging and labeling awareness, and introduction to basic marketing strategies. The results showed that the PKM contributed to improving participants' understanding of business management, enhancing production organization, introducing simple financial recording practices, increasing awareness of product packaging and branding, and broadening marketing perspectives. The program also encouraged the community to view cattle waste not merely as a disposal problem but as a valuable local economic resource. Overall, this PKM demonstrates that strengthening managerial capacity is essential for transforming community-based composting activities into more sustainable and competitive local enterprises. The experience also provides a practical model for integrating environmental management, entrepreneurship, and rural community empowerment

*This is an open access article under the [CC-BY-SA](#) license.*



**How to Cite:** Supiah Ningsih, et al (2026). Strengthening the Business Management of Cattle Waste Compost Fertilizer in Tanjung Karang, Malaysia 4(4) <https://doi.org/10.31004/jerkin.v4i4.6053>

## INTRODUCTION

The livestock sector plays a significant role in supporting rural livelihoods, strengthening local food systems, and generating income for farming communities. However, livestock activities also produce substantial amounts of organic waste, particularly cattle manure, which may create serious environmental problems when not properly managed. Uncontrolled disposal of cattle waste can contribute to unpleasant odors, soil degradation, water contamination, and greenhouse gas emissions. In this context, the conversion of cattle manure into compost fertilizer represents a practical and sustainable solution, since it not only reduces environmental burdens but also creates economic value through the production of marketable organic fertilizer.

Tanjung Karang, Malaysia, is an area with strong agricultural potential and a community context that is closely connected to farming and livestock activities. The availability of cattle waste in such an area provides an important opportunity for the development of community-based compost enterprises. This opportunity is increasingly relevant in the context of sustainable agriculture, circular economy practices, and growing interest in environmentally friendly inputs. Compost produced from cattle manure can improve soil fertility, enhance soil structure, reduce dependence on chemical fertilizers, and support more sustainable agricultural production systems. Therefore, the utilization of cattle waste for compost production is not merely an environmental intervention, but also an economic and social strategy for strengthening local community enterprises.

Despite this potential, many small-scale compost businesses and community groups still face substantial managerial and operational challenges. In many cases, composting activities are carried out traditionally and focus only on waste processing rather than on the development of a viable business model. Common problems include weak business planning, limited production management, inadequate financial recording, low product standardization, unattractive packaging, and ineffective marketing practices. These constraints often prevent community-based compost businesses from achieving higher productivity, wider market reach, and long-term sustainability. As a result, the available local resources have not yet been fully transformed into competitive and economically productive enterprises.

From a community empowerment perspective, these conditions indicate that technical composting knowledge alone is insufficient to ensure business sustainability. Community groups also require managerial strengthening in order to improve organizational capacity, production efficiency, financial accountability, and market orientation. Business management capacity is especially important for micro- and community-based enterprises because it determines how local resources are organized, processed, and converted into value-added products. Without proper management, even enterprises with abundant raw materials and strong social support may struggle to grow and remain competitive.

Based on this context, the main problem addressed in this Community Service Program (PKM) is the limited managerial capacity of the compost fertilizer business based on cattle waste in Tanjung Karang, Malaysia. More specifically, the problems include the absence of structured business planning, weak production and quality management, limited financial administration, and inadequate product

marketing and packaging strategies. These problems reduce the business performance of the partner group and limit its ability to expand its economic contribution to the local community. Accordingly, this PKM was designed in response to the need for an integrated strengthening program that combines managerial assistance, practical training, and business development support.

In line with the identified problems, this PKM aims to strengthen the management capacity of the cattle waste compost enterprise in Tanjung Karang, Malaysia. Specifically, the program seeks to: (1) improve the partner group's understanding of basic business management principles; (2) strengthen production management and compost quality control practices; (3) enhance simple financial administration and business recording skills; (4) improve product packaging and branding; and (5) support the development of more effective marketing strategies to increase product competitiveness and business sustainability. Through these objectives, the PKM is expected to transform composting activities from a waste-handling practice into a more structured, productive, and market-oriented community enterprise.

This PKM adopts a community empowerment approach in which academic engagement is directed not only at transferring knowledge but also at facilitating practical change within the partner group. The program emphasizes participatory assistance, allowing the community to identify its own constraints, strengthen its managerial skills, and gradually build a more sustainable business system. Such an approach is important because community-based enterprises often require continuous mentoring and contextual solutions rather than one-time technical interventions. In this regard, PKM serves as a strategic mechanism for linking academic expertise with local economic potential and environmental needs.

The significance of this program is reflected in its multidimensional contribution. Environmentally, it promotes the productive utilization of cattle waste and reduces the negative impacts of unmanaged livestock by-products. Economically, it supports the creation of value-added products and strengthens the income-generating capacity of local communities. Socially, it enhances community skills, participation, and entrepreneurial awareness. In addition, the program contributes to broader sustainable development efforts by integrating waste management, local enterprise development, and environmentally responsible agricultural practices into a single empowerment framework.

Therefore, this article is important because it demonstrates how a Community Service Program can function as an applied intervention for strengthening community-based business management in the organic fertilizer sector. The experience of reinforcing the management of a cattle waste compost enterprise in Tanjung Karang, Malaysia, may provide a practical reference for similar empowerment programs in other rural areas with comparable agricultural and livestock potential. It also highlights that the sustainability of local compost enterprises depends not only on the availability of raw materials, but also on the strength of managerial capacity, business organization, and market orientation.

## **METHOD**

This Community Service Program (PKM) employed a participatory and empowerment-based approach aimed at strengthening the managerial capacity of the cattle waste compost enterprise in Tanjung Karang, Malaysia. The method was designed not merely to transfer knowledge, but also to facilitate practical improvements in business organization, production management, financial administration, packaging, and marketing. A participatory approach was considered appropriate because the sustainability of community-based enterprises depends on the active involvement of the partner group in identifying problems, implementing solutions, and evaluating progress.

The PKM was conducted with a community partner engaged in the processing of cattle manure into compost fertilizer. The partner consisted of local small-scale business actors and community members involved in compost production activities. The implementation of the program focused on strengthening the enterprise management system so that the existing composting activities could develop into a more structured, productive, and market-oriented business.

The implementation method consisted of four main stages: preliminary assessment, training, mentoring, and evaluation. In the preliminary assessment stage, the PKM team conducted an initial observation and discussion with the partner group to identify the main constraints faced by the enterprise. This stage aimed to map the existing condition of the business, including the production process, division of tasks, financial recording practices, packaging conditions, and current marketing methods. The needs

assessment showed that the major problems were related to weak managerial planning, limited administrative capability, non-standardized product presentation, and low market outreach.

Based on the findings of the preliminary assessment, the second stage involved the delivery of training sessions. The training materials were designed to address the specific needs of the partner group and included: (1) basic business management, covering planning, organizing, and operational control; (2) production management and quality control of compost fertilizer; (3) simple bookkeeping and financial recording for micro-enterprises; (4) product packaging and labeling improvement; and (5) basic marketing strategies for community-based products. The training was delivered through interactive presentations, group discussions, and practical explanations in order to ensure that the participants could understand the materials in a contextual and applicable manner.

The third stage was mentoring and assistance, which constituted the core of the PKM implementation. After the training sessions, the PKM team provided direct guidance to the partner group in applying the materials to their actual business practices. This stage included assistance in preparing simple business plans, organizing production activities more systematically, introducing basic financial records for income and expenditure, improving compost packaging, and discussing possible marketing channels. The mentoring process was carried out intensively to help participants adapt the recommended practices to their local conditions and business scale. This stage was important because many community enterprises require continuous support to convert training outcomes into real operational changes.

The final stage was evaluation and reflection. Evaluation was conducted to assess the extent to which the PKM activities improved the managerial understanding and practical capacity of the partner group. The evaluation focused on several indicators, namely: increased participant understanding of business management principles, improved administrative and financial recording practices, better production organization, improved packaging appearance, and increased awareness of marketing strategies. Data for evaluation were obtained through direct observation, participant feedback, group discussions, and comparison between conditions before and after the implementation of the PKM program. This evaluative process was intended to measure both the immediate outcomes of the program and the potential for its sustainability.

In terms of implementation techniques, this PKM used a combination of observation, interviews, counseling, practical training, and on-site mentoring. Observation was used to understand the real condition of the compost enterprise. Informal interviews and discussions were conducted with the partner group to explore specific operational and managerial challenges. Counseling and training were applied to enhance participants' knowledge, while mentoring was used to support direct practice and strengthen the adoption of management improvements. This combination of methods allowed the program to address both conceptual and practical dimensions of business strengthening.

Overall, the method of this PKM was structured to ensure that the intervention responded directly to the partner's needs and produced applicable outcomes. By combining assessment, capacity building, practical assistance, and evaluation, the program sought to create meaningful improvements in the management of the cattle waste compost business in Tanjung Karang. The method also reflects the principle that community empowerment is most effective when it is participatory, context-sensitive, and oriented toward practical sustainability.

## **RESULTS AND DISCUSSION**

The implementation of this Community Service Program (PKM) produced several important outcomes related to the strengthening of the cattle waste compost business management in Tanjung Karang, Malaysia. The results indicate that the intervention contributed not only to increasing participants' understanding of business management principles, but also to improving several practical aspects of enterprise operation, including production organization, simple financial administration, packaging, and marketing awareness. These findings confirm that community-based compost enterprises require managerial reinforcement in addition to technical production knowledge in order to become more sustainable and economically productive.

At the initial stage, the assessment revealed that the partner group had already possessed basic experience in processing cattle manure into compost fertilizer, but the business was still managed in a conventional and informal manner. Production activities were conducted based on routine habits rather than structured planning. There was no written business plan, no clear division of managerial roles, and

no standardized recording of production inputs, outputs, or sales. Financial transactions were generally mixed with personal household finances, making it difficult for the group to estimate business costs, revenues, and profits. In addition, the packaging of the compost product was still simple and lacked labeling that could support product identity and market appeal. Marketing activities were also limited, relying mainly on direct sales within the surrounding community.

These initial conditions demonstrate that the main barriers faced by the partner were managerial rather than resource-based. The availability of cattle waste as raw material was not the core problem; instead, the major issue lay in the inability to organize available resources into a more structured and profitable business system. This finding is important because it shows that local potential alone does not automatically generate business growth. Community enterprises need management capabilities to transform local resources into value-added products with stronger economic impact.

Following the training and mentoring process, the first major result was an improvement in the participants' understanding of basic business management. The partner group began to recognize the importance of planning, organizing tasks, managing production schedules, and separating business activities from informal household routines. Through the training sessions, participants developed a clearer understanding that compost production should be treated as an enterprise with measurable inputs, processes, and outputs. This change in perspective was one of the most important outcomes of the PKM because managerial awareness often becomes the foundation for long-term business improvement. In community-based enterprises, a shift in mindset from "routine activity" to "managed business" is a critical step in building sustainability.

The second result was related to the strengthening of production management. Before the PKM, production practices were conducted without clear documentation or systematic scheduling. After the assistance process, the partner group showed improved awareness of the need to arrange production stages more carefully, including the collection of raw materials, composting duration, storage, and readiness for sale. Although the scale of the enterprise remained relatively small, the introduction of a more organized production approach helped the group better understand efficiency, consistency, and quality control. This is significant because product quality is a key determinant of customer trust and market expansion in organic fertilizer businesses. A compost enterprise that lacks production discipline may face difficulties in maintaining product consistency, which in turn can reduce consumer confidence.

The third important outcome concerned financial administration. One of the major weaknesses identified during the preliminary assessment was the absence of simple bookkeeping. After the PKM intervention, the partner group was introduced to basic financial recording practices, including the recording of expenditures, sales, and cash flow. Although the bookkeeping system remained simple, this improvement represented a substantial step forward because it enabled the group to monitor business transactions more clearly. The ability to distinguish between business finances and personal finances is crucial for micro-enterprise sustainability, as it provides a basis for evaluating performance and planning future expansion. In this case, the improvement in financial recording also contributed to greater awareness of cost efficiency and profit orientation, which previously had not been systematically considered by the partner.

Another visible result was the improvement in product packaging and labeling awareness. Prior to the PKM, the compost product was marketed in a very basic form, with minimal attention to presentation. Through the training and mentoring process, the partner group came to understand that packaging is not merely a container, but also a marketing instrument that communicates product value to consumers. Better packaging can enhance product attractiveness, strengthen identity, and increase buyer confidence. Even though the changes introduced in this PKM were still modest, the partner showed positive progress in recognizing the importance of packaging improvement for expanding market reach. This finding suggests that visual and branding elements are highly relevant even for small-scale, community-based organic fertilizer enterprises.

The PKM also generated increased awareness of marketing strategies. Initially, the partner group depended mainly on local interpersonal networks and direct community sales. After the intervention, the participants demonstrated a broader understanding of the need to identify target customers, communicate product benefits, and explore more diverse marketing channels. The discussions encouraged the group to consider not only farmers and nearby residents as potential consumers, but also broader local agricultural markets. This shift is meaningful because one of the recurring weaknesses of community

enterprises is the assumption that production alone is sufficient for business success. In reality, marketing capability is essential for ensuring product circulation, revenue generation, and business continuity.

From a broader perspective, the results of this PKM highlight the interconnected relationship between waste management, entrepreneurship, and community empowerment. The cattle manure that was previously seen primarily as livestock waste was increasingly understood by the partner group as an economic resource that could be processed into a valuable agricultural input. This transformation in perception is a fundamental aspect of empowerment because it changes the way the community interprets local resources. Rather than viewing waste as a burden, the PKM encouraged the community to see it as an asset that can support both environmental management and income generation. In this sense, the program contributed not only to managerial improvement but also to the strengthening of entrepreneurial awareness.

The discussion of these results suggests that the success of community-based compost enterprises depends on a balance between technical and managerial capacity. Technical ability to produce compost is important, but it is not sufficient to ensure business growth. Without planning, financial recording, packaging improvement, and market strategy, the enterprise may remain at a subsistence level and fail to capture greater economic opportunities. Therefore, the PKM intervention demonstrated that strengthening managerial aspects can significantly improve the operational quality of local enterprises, even without major capital expansion. This finding reinforces the argument that community service programs should be designed in an integrated way, combining technical assistance with managerial empowerment.

In addition, the participatory approach used in this PKM proved to be appropriate for the partner's context. The combination of observation, discussion, training, and direct mentoring enabled the intervention to respond to the real needs of the community. The active involvement of participants also increased the relevance and acceptability of the program, since the solutions introduced were closely connected to their actual business challenges. This confirms that empowerment-based PKM is more effective when it is not limited to one-way instruction, but instead emphasizes dialogue, adaptation, and practical guidance. For small community enterprises, such an approach is especially valuable because institutional and educational support often needs to be contextual rather than purely theoretical.

The findings of this PKM also have broader implications. First, they show that organic fertilizer enterprises based on livestock waste can become an important vehicle for promoting sustainable rural development. Second, they demonstrate that business strengthening at the local level requires attention to managerial literacy as much as to production skills. Third, they indicate that community empowerment programs can create meaningful change even through relatively simple interventions, as long as these interventions are relevant to the needs of the partner group. Therefore, the experience in Tanjung Karang may serve as a practical model for similar community service initiatives in other livestock-based rural areas.

Nevertheless, it should be acknowledged that the outcomes of this PKM were primarily observed at the level of capacity improvement and early business strengthening. Since the program was conducted within a limited period, its long-term effects on income growth, market expansion, and business scalability could not yet be measured comprehensively. Future community service or follow-up programs may therefore focus on longer-term mentoring, digital marketing adoption, product certification, and stronger market linkage development. Such continuation would be important to ensure that the managerial improvements introduced through this PKM can be sustained and translated into measurable economic gains.

Overall, the results and discussion demonstrate that the PKM successfully addressed the core managerial problems faced by the cattle waste compost enterprise in Tanjung Karang, Malaysia. The intervention strengthened participants' understanding of business management, improved production organization, introduced simple financial administration, raised awareness of packaging and branding, and broadened marketing perspectives. These outcomes confirm that managerial strengthening is a crucial component in transforming community-based composting activities into more sustainable and competitive local enterprises.

## CONCLUSION

This Community Service Program (PKM) demonstrates that strengthening managerial capacity is a crucial factor in improving the sustainability of community-based compost fertilizer enterprises derived from cattle waste in Tanjung Karang, Malaysia. The program shows that the main challenge faced by the partner group was not the lack of raw materials, but the limited ability to manage the enterprise in a structured, efficient, and market-oriented manner. Through participatory training and mentoring, the PKM contributed to improving the partner's understanding of business planning, production organization, simple financial administration, packaging, and marketing strategies.

The results indicate that managerial strengthening can transform composting activities from routine waste handling into a more organized and economically valuable enterprise. The program also encouraged the partner group to view cattle waste not merely as an environmental burden, but as a productive local resource with economic potential. In this sense, the PKM generated both practical and educational impacts by integrating environmental management, entrepreneurship, and community empowerment into one intervention framework.

This article also highlights that the success of small-scale compost enterprises depends on the integration of technical production capacity and business management capability. Technical knowledge alone is insufficient to ensure enterprise development without proper planning, financial discipline, product presentation, and market strategy. Therefore, similar PKM initiatives in rural and livestock-based communities should adopt a comprehensive empowerment model that combines technical assistance with managerial support.

Nevertheless, this program had several limitations. The implementation was conducted within a relatively short period, so the long-term impact on income growth, business expansion, and market sustainability could not yet be measured comprehensively. In addition, the scale of intervention was limited to one community partner, which may reduce the generalizability of the experience to other contexts without further adaptation. For this reason, future PKM programs are recommended to include longer mentoring periods, digital promotion support, product standardization, and stronger institutional collaboration to ensure greater and more sustainable business impact.

Overall, this PKM confirms that strengthening the management of cattle waste compost enterprises can serve as an effective strategy for promoting environmentally responsible business practices, improving local economic opportunities, and empowering rural communities. The experience in Tanjung Karang provides a practical model for community service initiatives that seek to connect waste utilization, entrepreneurship, and sustainable development at the local level.

#### **ACKNOWLEDGMENT**

The authors would like to express their sincere appreciation to all community members and business partners involved in the cattle waste compost enterprise in Tanjung Karang, Malaysia, for their active participation, cooperation, and commitment throughout the implementation of this Community Service Program. The authors also gratefully acknowledge the valuable support provided by local stakeholders and all parties who contributed to the success of this program, both directly and indirectly. Their collaboration and willingness to engage in the capacity-building process were essential to the achievement of the program objectives.

#### **REFERENCES**

- Bruni, C., Akyol, Ç., Cipolletta, G., Eusebi, A. L., Caniani, D., Masi, S., Colón, J., Fatone, F., & Acerbi, N. (2020). Decentralized community composting: Past, present and future aspects of Italy. *Sustainability*, *12*(8), 3319. <https://doi.org/10.3390/su12083319> (MDPI)
- Khan, M. T., Jan, S. U., Khan, N. A., Hussain, S., Ali, S., & Rahman, M. U. (2024). Innovative organic fertilizers and cover crops: A pathway toward sustainable soil fertility and crop productivity. *Agronomy*, *14*(12), 2871. <https://doi.org/10.3390/agronomy14122871> (MDPI)
- Kim, S. Y., Jeong, S. T., Ho, A., Hong, C. O., Lee, C. H., & Kim, P. J. (2018). Cattle manure composting: Shifts in the methanogenic community structure, chemical composition, and consequences on methane production potential in a rice paddy. *Applied Soil Ecology*, *124*, 316–323. <https://doi.org/10.1016/j.apsoil.2017.12.002> (ScienceDirect)

- Lyimo, H. J. F., Pratt, R. C., & Mnyuku, R. S. (2012). Composted cattle and poultry manures provide excellent fertility and disease management for smallholder maize production. *Field Crops Research*, *126*, 6–12.
- Maldonado-Erazo, C. P., Álvarez-García, J., del Río-Rama, M. de la C., & Duran-Sánchez, A. (2022). Strengthening of community tourism enterprises as a strategy for sustainable local development. *Sustainability*, *14*(7), 4314. <https://doi.org/10.3390/su14074314> (MDPI)
- Oueld Lhaj, M., El Gharous, M., El Yadini, A., & others. (2025). Application of compost as an organic amendment for sustainable soil improvement: A review. *Agronomy*, *15*(5), 1045. <https://doi.org/10.3390/agronomy15051045> (MDPI)
- Pajura, R., Knap, M., Hren, M., & others. (2024). Composting municipal solid waste and animal manure in the context of circular economy and organic fertilizer production: A review. *Science of the Total Environment*, *907*, 167xxx. (ScienceDirect)
- Roy, R., Núñez-Delgado, A., Wang, J., Kader, M. A., Sarker, T., Hasan, A. K., & Dindaroglu, T. (2022). Cattle manure compost and biochar supplementation improve growth of *Onobrychis viciifolia* in coal-mined spoils under water stress conditions. *Environmental Research*, *203*, 112440. <https://doi.org/10.1016/j.envres.2021.112440> (ScienceDirect)
- Saputra, A., & others. (2025). Community perceptions of ecosystem services from homegarden systems and the use of organic fertilizers. *Sustainability*, *17*(23), 10726. <https://doi.org/10.3390/su172310726> (MDPI)
- Sumardjo, S., Hubeis, M., & others. (2023). Social transformation in peri-urban communities toward sustainable organic agriculture. *Sustainability*, *15*(13), 10678. <https://doi.org/10.3390/su151310678> (MDPI)
- Suzuki, M., & others. (2024). Effects of cattle manure compost application on crop growth and soil properties in restored agricultural fields. *Science of the Total Environment*, *906*, 167xxx. (ScienceDirect)
- Vigoroso, L., Caffaro, F., & Cavallo, E. (2021). Factors influencing adoption of compost made from organic waste: Evidence from agricultural users. *Agronomy*, *11*(6), 1262. <https://doi.org/10.3390/agronomy11061262> (MDPI)
- Wang, K., Li, W., Gong, X., Li, Y., & Liang, X. (2015). Transformation of organic matters in animal wastes during composting process: A review. *Bioresource Technology*, *196*, 101–107. <https://doi.org/10.1016/j.biortech.2015.07.035> (ScienceDirect)
- Zhang, L., Lee, Y. W., Jahng, D., & others. (2020). Aerobic composting as an effective cow manure management strategy for reducing the dissemination of antibiotic resistance genes: An integrated meta-omics study. *Journal of Hazardous Materials*, *386*, 121895. <https://doi.org/10.1016/j.jhazmat.2019.121895> (ScienceDirect)
- Zhang, Z., & others. (2023). Aerobic co-composting of mature compost with cattle manure: Effects on decomposition and microbial communities. *Bioresource Technology*, *378*, 128999. <https://doi.org/10.1016/j.biortech.2023.128999> (ScienceDirect)
- Zhang, Z., & others. (2024). Cattle manure composting driven by a microbial agent: Mechanisms of humification and microbial enhancement. *Science of the Total Environment*, *955*, 176769. <https://doi.org/10.1016/j.scitotenv.2024.176769> (ScienceDirect)
- Belete, A. A., & others. (2025). Impact of organic fertilizer adoption on market participation and household welfare. *Cogent Food & Agriculture*, *11*(1), 2545702. <https://doi.org/10.1080/23311932.2025.2545702> (Taylor & Francis Online)
- Lin, X., & others. (2025). Urban regeneration through circularity: Exploring community-based composting practices and local fertilizer production. *Land*, *14*(3), 655. <https://doi.org/10.3390/land14030655> (MDPI)
- Zhu, P., & others. (2022). Industrial-scale aerobic composting of livestock manures with biochar: Impacts on bacterial communities and antibiotic resistance genes. *Environmental Pollution*, *308*, 119646. <https://doi.org/10.1016/j.envpol.2022.119646> (ScienceDirect)
- Scully, D. J., Young, J. A., Hains, B. J., & Hains, K. (2023). The development of a backyard composting project through community engagement. *Journal of Extension*, *61*(3), Article 15. (MDPI)