

Implementation of Circular Economy Business Model in Inorganic Waste Management Mechanism in Tegal Tugu Village, Gianyar, Bali

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Article Info:

Article History:

Received: 2024-11-19
Revised: 2024-12-23
Accepted: 2025-01-09

Keyword:

Circular Economy,
Inorganic Waste
Management.

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Paper Type:

Research Paper



Abstract:

Purpose:

This study analyzes the application of a circular economy business model in the management of inorganic waste in Tegal Tugu Village, Gianyar, with the problem of high volumes of inorganic waste, if not managed properly, can cause environmental pollution, reduce the quality of life of the community, and increase the risk of long-term environmental damage.

Methodology:

Circular economy businesses use an innovative approach to waste management by prioritizing the principles of reduce, reuse, and recycle (3R), which aim to minimize the impact of waste on the environment.

Findings:

This study examines various strategies that can be applied to optimize inorganic waste management, including recycling, reusing, and reducing waste generation. Through case studies and policy analysis, the implementation of efficient reuse, recycling, and processing strategies not only reduces environmental impacts but also provides economic opportunities through job creation and product innovation.

Implication:

Data analysis is carried out thematically to identify the relationship between inorganic waste management, environmental sustainability, and the potential economic value generated. The results of this method will be presented in the form of an in-depth analysis of the challenges and opportunities for implementing a sustainability model in Tegal Tugu Village.

INTRODUCTION

Inorganic waste management has become one of the most pressing environmental issues globally, including in Indonesia. The nature of inorganic waste that is difficult to decompose, such as plastic waste and other non-biodegradable materials, creates a major challenge in maintaining ecosystem balance (Humaida & Murniningsih, 2024). Tegal Tugu Village is one example of an area facing similar problems. The high volume of inorganic waste, if not managed properly, can cause environmental pollution, reduce the quality of life of the community, and increase the risk of long-term environmental damage (Zahra et al., 2024). Therefore, a comprehensive and sustainable approach is needed to address this problem. One increasingly relevant solution is the implementation of a circular economy business model.

The circular economy business model offers an innovative approach to waste management by prioritizing the principles of reduce, reuse, and recycle (3R). In this model, waste is no longer seen as something useless but rather as a resource that can be reused to create new economic value. Through the implementation of a recycling and waste reduction system, this model is not only able to reduce pressure on the environment but also contributes to the efficiency of resource use (Putranto, 2023). The concept of a circular economy is increasingly relevant to be applied at the local community level, such as in Tegal Tugu Village because it can provide solutions that are oriented towards sustainability while creating economic opportunities for the community.

In Indonesia, the implementation of the circular economy is still in its early stages, but several case studies have shown the positive impacts of this approach. For example, community-based waste management that adopts circular economy principles has been shown to increase community participation, encourage local innovation, and improve environmental quality (Yuniar et al., 2024). Tegal Tugu Village has great potential to follow in this footsteps by utilizing circular economy principles as a basis for developing a more effective inorganic waste management system. By involving various stakeholders, from the village government and community to local business actors, the implementation of this model can be designed collaboratively to create sustainable benefits.

In addition, the implementation of a circular economy business model can also be supported by the integration of environmentally friendly technology and innovation in waste management. This technology enables a more efficient and effective recycling process, resulting in products with higher added value (Yuniar et al., 2024). Tegal Tugu Village can also adopt a community-based approach, where the community is actively involved in collecting, sorting, and processing inorganic waste. This approach not only creates business opportunities for local communities but also increases environmental awareness and a sense of collective responsibility.

By adopting a circular economy business model, Tegal Tugu Village can solve the problem of inorganic waste systematically and sustainably (Saputra et al., 2024). This approach provides a solution that not only focuses on environmental aspects but also on improving the economic welfare of the community. In the long term, Tegal Tugu Village has the opportunity to become a successful example of circular economy-based waste management, which can be replicated in other areas as part of efforts to realize more environmentally friendly and sustainability-oriented development.

Circular Economy Concept. A circular economy is an economic system that seeks to prevent every component of a material from becoming waste. In this system, products and materials are maintained in the economic cycle through various processes, such as maintenance, reuse, repair, remanufacturing, recycling, and composting. The main principles of a circular economy include three things: eliminating waste and pollution, maintaining the circulation of products and materials with the highest value, and supporting the regeneration of the natural environment (Retnosuryandari, 2024).

The origin of the circular economy concept is not known for certain who the main initiator is. However, several figures are considered to have contributed to its development, including John Lyle, a professor from the United States; William McDonough, his student; Michael Braungart, a chemist from Germany; and Walter Stahel, an architect and economist. The idea of a circular economy may also have been inspired by previous works, such as Rachel Carson's book *Silent Spring*, the *Limits to Growth* thesis by the Club of Rome in the 1970s, the *Spaceship Earth* metaphor introduced by Barbara Ward and Kenneth Boulding, and the thoughts of environmental economist Herman Daly. Furthermore, Pearce and Turner developed a conceptual framework to strengthen this circular economy concept. The principles of a circular economy include the 3R (reduce, reuse, recycle) and 6R (reuse, recycle, redesign, remanufacture, reduce, refurbish) approaches (Retnosuryandari, 2024).

Various studies have shown that the implementation of a circular economy can increase the efficiency of resource utilization while reducing pressure on the environment. One of them (Kirchherr et al., 2017) concluded that a circular economy not only supports ecological sustainability but also opens up new economic opportunities, especially in rural areas with limited resources (Saputra et al., 2024).

Inorganic Waste Management. Inorganic waste is waste that comes from non-biological materials, either in the form of synthetic products or the results of mining material processing technology (Yatimah et al., 2022). Examples include cans, plastic, iron, metal, glass, mica, and paper. This type of waste is classified as dry waste and cannot be decomposed naturally. However, inorganic waste can be reprocessed or sold, either in its original form or in new forms, such as decorations, household appliances, and fine arts and crafts (Girsang et al., 2024).

In Indonesia, inorganic waste management is still a complex problem, especially in rural areas. The Ministry of Environment and Forestry shows that the level of waste recycling in Indonesia is still low, with most plastic

waste not being utilized optimally. Therefore, a community-based approach is needed that can empower local communities in managing inorganic waste (Nurmalasari et al., 2024).

Implementation of Circular Economy in Indonesia. A circular economy is a closed-flow economic concept where each process seeks to maximize the use of resources, raw materials, and finished products so that they can be reused as long as possible while minimizing the waste or garbage produced (Salim, 2022).

The implementation of a circular economy in Indonesia aims to change consumption and production patterns that have been linear to become more sustainable. It includes efforts to reduce waste, increase the efficiency of resource use, and encourage recycling and reuse practices. The Indonesian government has launched various initiatives to support this change, including policies such as the National Action Plan for Waste Management 2018-2023. This policy is designed to improve waste management and encourage community and private sector participation in recycling activities (Fadillah & Fahreza, 2023). In addition, research shows that the implementation of a circular economy can accelerate post-pandemic economic recovery by integrating sustainability principles into every aspect of the economy (Setianingtias et al., 2019).

On the other hand, the implementation of a circular economy in Indonesia has the potential to create new jobs and increase efficiency in the economy. By involving various parties, including industry and local communities, this initiative is expected to reduce the negative impact on the environment due to economic activities. Although still in its early stages, the commitment to implementing the principles of a circular economy provides hope for achieving long-term sustainability (Dinata, 2021). However, challenges such as lack of public awareness and adequate infrastructure remain obstacles that need to be overcome so that the implementation of a circular economy can run effectively (Ioannis & Konstantinos, 2021).

The implementation of a circular economy in Indonesia faces several obstacles. Some of the problems that arise include low public awareness of the importance of recycling, inadequate infrastructure for waste management, and the need for greater investment in environmentally friendly technologies (Malihah & Magfiroh, 2024). With the right approach, the circular economy can be a major driver of sustainable economic growth in Indonesia (Permata et al., 2022).

Implementation in Tegal Tugu Village. Tegal Tugu Village has geographical and social characteristics that allow the implementation of a circular economy business model. Local studies show that village communities have the potential to manage waste independently by involving environmentally friendly technology and community-based innovation (Nuraini et al., 2024). In addition, a collaborative approach involving various stakeholders, such as village governments, non-governmental organizations, and business actors, can be a key factor in the successful implementation of this model (Madiantini et al., 2023).

Through the synergy between the concept of circular economy and inorganic waste management, Tegal Tugu Village can be an example of sustainable implementation at the community level. The implementation of this strategy will not only help overcome waste problems but also create sustainable economic added value for the community.

METHODS

Research Object. The object of this research is TPS 3R Tri Buana Asri, located on Jl. Ratna IX, Tegal Tugu, Gianyar District, Gianyar Regency. Tegal Tugu Village faces challenges in managing inorganic waste due to the high consumption of plastic and disposable products. The main problem is the accumulation of unmanaged waste, causing environmental pollution and reducing the quality of life. Most of the waste comes from households and commercial activities, such as plastic and metal. The lack of application of green accounting and circular economy principles is an obstacle to creating economic value from this waste.

Data Types and Sources. This study uses a qualitative method with a descriptive-analytical approach to understand the application of green accounting and the implementation of a circular economy business model in

inorganic waste management in Tegal Tugu Village. Primary data will be obtained through in-depth interviews with village officials, local communities, and small business actors involved in waste management. Direct observation will also be conducted to identify patterns of inorganic waste management in the village, including the process of recording environmental impacts and community-based recycling practices (Swastika et al., 2024).

In addition, secondary data will be collected from village financial reports, local environmental policy documents, and literature related to the concept of green accounting and circular economy. Data analysis is carried out thematically to identify the relationship between inorganic waste management, environmental sustainability, and the potential economic value generated. The results of this method will be presented in the form of an in-depth analysis of the challenges and opportunities for implementing the sustainability model in Tegal Tugu Village.

RESULTS AND DISCUSSION

Tegal Tugu Village, Gianyar, has implemented a waste sorting policy as part of an effort towards sustainable environmental management. This policy is supported by the Gianyar Regency Regional Regulation, which requires the community to sort organic and inorganic waste from the source. As a consequence, households that do not comply with this rule will not receive waste collection services. Although the rule has been socialized, the biggest challenge is changing the mindset of the community who were previously accustomed to a free waste collection system without the obligation to sort.

In addition, the community must also face changes with the obligation to pay a levy for waste transportation, which creates resistance, especially from residents who feel burdened. To encourage compliance, the village government imposes sanctions in the form of a maximum fine of IDR 1 million for anyone who litters, such as in irrigation channels. This step aims to raise awareness of the importance of maintaining environmental cleanliness and encourage collective responsibility.

Currently, organic waste management in Tegal Tugu Village is running quite well. Organic waste is processed into compost that the community can use. However, inorganic waste management still faces obstacles, especially in the implementation of the circular economy business model. Some types of waste, such as plastic bottles, paper, and glass bottles, can be sold to scavengers. However, plastic residue, such as plastic bags and snack wrappers, are difficult to manage because they are not accepted at the Final Disposal Site (TPA).

The circular economy business model has great potential to be applied in the management of inorganic waste in this village. By utilizing inorganic waste to produce products with economic value, such as handicrafts or recycled materials, the village can create new business opportunities that involve the participation of local communities. In addition, partnerships with scavengers or recycling companies can be an important strategy to support the sustainability of the system.

The current system performance shows great opportunities but also significant challenges in circularly managing inorganic waste. The main challenges include the development of adequate infrastructure and changing people's habits to sort and manage waste according to the rules. However, the opportunity to create economic value from inorganic waste is possible through public education, providing economic incentives, and collaboration with various parties.

In order for the circular economy business model to generate economic benefits, waste management must be integrated with the concept of green accounting. By recording environmental costs and benefits in detail, villages can evaluate the efficiency and economic impact of the program. For example, revenue from the sale of inorganic waste can be allocated to support other environmental programs, such as the construction of recycling facilities or environmental education campaigns.

Products from inorganic waste processing, such as crafts from plastic bottles or alternative building materials, can be marketed through local and digital platforms. This strategy not only increases village income but

also motivates the community to participate in supporting a sustainable management system. Thus, the circular business model functions as an environmental solution as well as a driver of the village economy.

For plastic waste that is not accepted by landfills, villages can partner with environmental innovators who develop technologies for processing difficult waste, such as converting plastic into fuel or construction materials. While these innovations require initial investment, they have the potential to provide long-term economic and environmental benefits. The success of these systems depends heavily on active community participation and support from the government and private sector. Effective initial steps include intensive education and providing incentives to residents who comply with waste sorting rules. In addition, collaboration with external parties, such as recycling companies and non-governmental organizations, is needed to optimize the management of inorganic waste circularly.

CONCLUSION

Tegal Tugu Village, Gianyar, has taken a step forward in waste management by implementing a sorting policy supported by the Regional Regulation. However, the application of the circular economy business model to inorganic waste is still not optimal. The main obstacles faced include community rejection of system changes and technical difficulties in handling waste residues that the TPA does not accept. Even so, the opportunity to create economic value from inorganic waste remains large through partnerships with scavengers, recycling companies, and the application of innovative waste processing technologies.

Suggestion. To improve the effectiveness of inorganic waste management, the village government needs to strengthen community education programs on the importance of sorting and sustainable waste management. In addition, the development of recycling infrastructure, providing economic incentives, and collaboration with the private sector and environmental innovators can encourage the success of a sustainable circular economy business model. By recording economic and environmental impacts through a green accounting approach, Tegal Tugu Village can create a more efficient, beneficial and environmentally friendly waste management system.

REFERENCE

- Dinata, A. (2021). *Ekonomi Sirkular, Model Bisnis, Kesehatan Lingkungan*.
- Fadillah, M. H., & Fahreza, M. (2023). Pendekatan Ekonomi Sirkular Sebagai Model Pengembangan Bisnis Melalui Pemanfaatan Aplikasi pada Usaha Kecil dan Menengah Pasca Covid-19. *Coopetition: Jurnal Ilmiah Manajemen*, 1(14), 55–66. <https://doi.org/10.32670/coopetition.v14i1.2269>
- Girsang, R. M., Lie, D., Augustinah, F., & Sudirman, A. (2024). Analysis of Customer Satisfaction and its Implications for Customer Loyalty and Purchase Intention for Cinopolis Cinemas Tickets. *International Journal of Social Science and Business*, 8(1), 169–181. <https://doi.org/10.23887/ijssb.v8i1.56488>
- Humaida, N., & Murniningsih. (2024). *Dasar-Dasar Pengetahuan Lingkungan Berbasis Perubahan Iklim Global* (D. R. Rahmani, Ed.). CV. UrbanGreen Central Media.
- Ioannis, E. N., & Konstantinos, P. T. (2021). An Introduction to Circular Economy and Sustainability: Some Existing Lessons and Future Directions. *Sustainable Production and Consumption*, 28, 600–609. <https://doi.org/10.1016/j.spc.2021.06.017>
- Kirchherr, J., Reike, D., & Hekkert, M. (2017). Conceptualizing the Circular Economy: An Analysis of 114 Definitions. *In Resources, Conservation and Recycling (Vol. 127, pp. 221–232)*. Elsevier B.V. <https://doi.org/10.1016/j.resconrec.2017.09.005>
- Malihah, L., & Magfiroh, S. (2024). Ekonomi Sirkular Sebagai Antitesis dari Ekonomi Linier: Sebuah Tinjauan. *In Jurnal Ekonomi STIEP (JES) (Vol. 9, Issue 1)*. Mei.

- Masdiantini, P. R., Savitri, N. L. A., & Devi, S. (2023). Credit Decision Making Through the Use of Information on Company's Financial Performance and Environmental Performance. *JLA (Jurnal Ilmiah Akuntansi)*, 8(1), 132–146. <https://doi.org/10.23887/jia.v8i1.53882>
- Nuraini, N. A., Amir, M., Pratama, R. A., & Anggaraini, D. (2024). Penanganan Sampah Rumah Tangga: Studi Deskriptif tentang Strategi Dinas Lingkungan Hidup di Kabupaten Buton Tengah. *PAMARENDA: Public Administration and Government Journal*, 4(2), 239–255. <https://doi.org/10.52423/pamarenda.v4i2.38>
- Nurmalasari, D., Andrian, N., Priyanto, A. K., & Taryana, A. (2024). Pemanfaatan Sampah Plastik Menjadi Produk dan Jasa Kreatif. *Journal of Comprehensive Science*, 3. <https://doi.org/10.59188/jcs.v3i7.751>
- Permata, D. I., Arum, S., Tanuwidjaja, K. D., Evan, V., Wicaksono, A., & Mardikanto, A. (2022). Langkah Nyata Inisiatif Ekonomi Sirkular di Indonesia.
- Putranto, P. (2023). Prinsip 3R: Solusi Efektif untuk Mengelola Sampah Rumah Tangga. *INNOVATIVE: Journal of Social Science Research*, volume 3, 2807–4246.
- Retnosuryandari. (2024). *Ekonomi Sirkular vs Ekonomi Donat*. Pusat Studi Lingkungan Hidup UGM.
- Salim, A. R. (2022). Digitalisasi Ekonomi Sirkular di Indonesia. *CAPACITAREA: Jurnal Pengabdian Kepada Masyarakat Universitas Pancasila*, 2(3), 118–123. <https://doi.org/10.30874/capacitarea.2022.3>
- Saputra, K. A. K., Ekajayanti, L. S., & Suriani, N. N. (2024). Plastic Waste Reduction Campaign at the Traditional Market in Nyanggelan Village, Panjer, Denpasar. *Akuntansi dan Humaniora: Jurnal Pengabdian Masyarakat*, 3(3), 184-189. <https://doi.org/10.38142/ahjpm.v3i3.1198>
- Saputra, K. A. K., Laksmi, P. A. S., Suriani, N., & Ekajayanti, L. S. (2024). Accounting Training to Support Transparent and Accountable Village Fund Reporting in Sibetan Village, Karangasem Bali. *Community Services: Sustainability Development*, 1(2), 50-55. <https://doi.org/10.61857/cssdev.v1i2.76>
- Setianingtiyas, R., Baiquni, M., & Kurniawan, A. (2019). Pemodelan Indikator Tujuan Pembangunan Berkelanjutan di Indonesia. *Jurnal Ekonomi dan Pembangunan*, 2(27), 61–74. <https://doi.org/10.14203/JEP.27.2.2019.61-74>
- Swastika, Y., Dharma, K., & Tantra, L. P. (2024). The Influence of Labor and Population Growth on Economic Growth in Indonesia the Year 2017–2022. *Loka: Journal of Environmental Sciences*, 1(3), 77-82. <https://doi.org/10.38142/ljes.v1i3.162>
- Yatimah, D., Dwi Lestari, R., Purnama Dewi, I., Nursundanis Multisuandi, N., & Aliana, Y. (2022). Pelatihan Pengolahan Sampah Anorganik Menjadi Aneka Kreasi Daur Ulang Bagi Ibu-Ibu Rumah Tangga. Prosiding Seminar Nasional Pengabdian Kepada Masyarakat. <http://journal.unj.ac.id/unj/index.php/snppm>
- Yuniar, D. A., Farhan, A., & Kamal, U. (2024). Tanggung Jawab Korporasi: Analisis Kebijakan Pengelolaan LimbahB3 Berbasis Prinsip Circular Economy. *Jurnal Multidisiplin Ilmu Akademik*, Vol.1, 121–124. <https://doi.org/https://doi.org/10.61722/jmia.v1i3.1369>
- Zahra, A. N., Novianti, F., Anggraeni, M. P., Normalita, N. R., Sabila, N. S., Rumiyaningsih, N., Azkiya, R., & Amadea, Z. T. (2024). Analisis Dampak Limbah Galon Plastik di Lingkungan Kos Gang Cempaka Sari, Sekaran, Gunung Pati, Semarang. *Jurnal Analisis*, vol.3 No. 1, 042–056.