

# Research Article

# Optimization of Household Waste Management Towards Circular Economy : Case Study in Kalianda District, South Lampung Regency

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**Abstract:** Effective household waste management based on the principles of the circular economy is an urgent need to create a clean and sustainable environment in Kalianda District. This study offers several strategic recommendations to improve the waste management system, including increasing public awareness through continuous education, strengthening law enforcement supported by incentives, optimizing waste management infrastructure, and developing multi-stakeholder collaborations involving the government, private sector, and local communities. The implementation of the Re-SOLVE framework (Regenerate, Share, Optimize, Loop, Virtualize, Exchange) is proposed to promote the realization of a circular economy in waste management. Additionally, regular monitoring and evaluation are essential to ensure the sustainability of the programs. By applying these measures, household waste management in Kalianda District is expected to become an effective, innovative model that contributes to environmentally conscious development.

Keywords: Circular; Economy; Environmental Sustainability; ReSOLVE Framework.

# 1. Introduction

The problem rubbish has become problem national and become issue important in problem environment urban. Emergence rubbish specifically rubbish congested urban (Municipal Solid Waste) no will reduce or finished even will Keep going increase along with growth population man as well as the more height and complexity activity humans (Mamashli et al, 2021). The emergence of trash that is not managed with Good can result bad in aspect social and environmental, such as water, land, air pollution, even can cause impact serious health (Yaashika et al, 2020).

As one of the Subdistrict the widest in South Lampung Regency, District You are here own The area covers 179.82 km2, consisting of from 25 villages and 4 sub-districts with population as many as  $\pm$ 98,673 people and has level density resident as many as 611 people / km 2 as well as rate growth resident by 0.67% in 2023 (South Lampung Regency in Figures, 2023). With the vastness of the territory owned and its height rate growth population, sub-district You are here own potential big For develop rapidly. However growth rate resident will always followed by an increase embossment waste produced . (Babu et al, 2021)

The results of the analysis by the South Lampung Regency Environmental Service are stated in document Regional Policy (Jakstrada) on Waste South Lampung Regency (2022) said that from amount overall embossment the waste in South Lampung Regency, only amounting to 41.838% of waste managed in 2020, while For 2021 percentage managed waste by 42.921%. One of the reason low effort management garbage in the District You are here is Because perception part big community in the District Kalianda who still look at rubbish as goods the rest that is not useful, isn't it? as source the power needed utilized. Therefore that, is needed a form effort management rubbish sustainable that is not only aiming For

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Copyright: © 2025 by the author. Submitted for possible open access publication under the terms and conditions of the Creative Commons Attribution (CC BY SA) license ( https://creativecommons.org/licenses/bysa/4.0/ ) reduce embossment rubbish but also provides benefit economy for the Community. Brendzel et al (2021) stated that one of the models that can give benefit economy However still support objective development sustainable is economy circular (Circular Economy).

The application of the circular economy concept to waste management, especially household waste, is the right concept. This concept is able to process household waste into a product that has economic value (Schröder et al., 2019). This concept offers the formation of new products from household waste that can reduce the amount of waste generated in the environment and make it a valuable product, both in terms of financial, social and environmental (Winans et al., 2017). The application of circular economy-based waste management is an effort to overcome the problem of waste generation in an area, one of which is Kalianda District. The high amount of waste generation in Kalianda District will of course gradually put significant pressure on the carrying capacity and capacity of the Kalianda District Environment. Several locations in Kalianda District have begun to be complained about by the surrounding community due to the piles of garbage, including the Inpres Market and the BOM Pier Fish Auction Place, Kalianda Village.

### 2. Method

This study uses a qualitative method approach. The use of qualitative methods in this study involves literature studies and interviews with key informants including representatives from the South Lampung Regency Environmental Service, the Kalianda District Government, and the Environmental Watch Organization "Waway Waste".

SWOT/ Strength, Weakness, Opportunity, Threat analysis is a popular qualitative analysis to find the best strategy in implementing a program or project. The SWOT analysis in this study is based on data from interviews with village-level government officials and community leaders in each village in Kalianda District. The information and data obtained will be used as a basis for determining the strengths, weaknesses, opportunities and threats that can be mapped in the IFAS and EFAS matrices (Rimantho and Marlina, 2021).

# 3. Discussion and Results

This research uses a descriptive qualitative approach with the aim of understanding in depth the leader's strategy in improving the quality of employee performance at PT Putri Arta Prima. Data collection was carried out through an in-depth interview method with purposively selected informants, namely company leaders, section heads, and several employees who have at least one year of work experience. Interviews are conducted in a semi-structured manner so that researchers can dig into information openly and flexibly, while still focusing on the main topic of the research. In addition, direct observation of the work environment is also carried out to strengthen the findings of the interviews, and documentation is used as complementary data through analysis of organizational structures, HR policies, and performance reports. The collected data was analyzed thematically through the stages of data reduction, coding, categorization, and drawing conclusions. To ensure the validity of the data, the researcher used the source triangulation technique and reconfirmed it to the informant (member check) (Sugiyono, 2019). The entire research process is carried out by maintaining research ethics, including maintaining the confidentiality of the identity of the informant and obtaining consent for conscious participation. This approach is expected to result in a comprehensive and contextual understanding of leadership practices in the company.

# 4. Results and Discussion

#### 4.1 Condition Management Household Waste in the Subdistrict You are here

Kalianda District has a population density of 434 people/km. The population in Kalianda District based on gender is 98,013 people consisting of 49,841 male residents and 48,172 female residents. The population in Way Urang Village has the largest population, namely 15.02%, consisting of 7,424 male residents and 7,297 female residents. The population of Kalianda District based on the highest age group is around 10-14 years, namely 9544 people or 9.74%. While the population of Kalianda District based on the lowest age group is 70-74 years old, as many as 1,562 people or 1.59%. (Kalianda District in Figures, 2023) Urban waste in Kalianda District comes from various activities of residents such as households, shops, offices, restaurants, lodging, public facilities and others. Each source of waste has different characteristics of waste generation and composition. In 2024, the South Lampung Regency Environmental Service conducted a Study on the Generation and Composition of Waste in the Kalianda Urban Area, based on the study, the average weight of Kalianda urban waste generation is 0.39 kg/person/day and the average volume of Kalianda urban waste generation is 1.75 liters/person/day. In residential and settlement areas, from 31 families that were used as samples and measured for 8 days, data on the volume of household waste produced was 1,611.8 liters or an average of 1.41 liters/person/day. The composition of waste in Kalianda City is dominated by organic waste such as vegetable waste, food scraps, etc. at 65%, followed by plastic waste at 11%, paper waste at 8%, and other types of waste.

Based on interviews conducted with respondents and key informants, the existing conditions of household waste management in Kalianda District were as follows:

The awareness and knowledge of the majority of the Kalianda District community regarding waste management is still low. The community is still confused about sorting organic and inorganic waste and tends to choose to burn the waste produced. The majority of the community is also not interested in managing the household waste produced because of the community's mindset that the waste problem should be handled by the government. This certainly causes low community participation in household waste management.

Suboptimal waste management. The household waste transportation system in Kalianda District to the TPA still experiences several obstacles such as residents who are reluctant to pay retribution fees, the absence of clear management, and road access that is too narrow for garbage trucks to pass through. This problem is increasingly pressing because the capacity and carrying capacity of the TPA are increasingly limited, but the amount of waste generated is increasing, the implementation of 3R in waste management has not been fully effective and optimal.

The role of waste management institutions is not yet effective. The pressing problem can be seen from the still limited budget allocation for waste management programs, and the support of the local government in terms of implementing waste management is still sectoral, not integrated and comprehensive.

The waste regulation has not been implemented effectively. The pressing problem can be seen from the fact that the Waste Management Regulation has not been widely disseminated to the entire community, and the weak enforcement of the Regional Regulation on Waste Management.

#### 4.2 SWAT Analysis

SWOT/ Strength, Weakness, Opportunity, Threat analysis is a popular qualitative analysis to find the best strategy in implementing a program or project. The SWOT analysis in this study is based on data from interviews with village-level government officials and community leaders in each village in Kalianda District. The information and data obtained will be used as a basis for determining the strengths, weaknesses, opportunities and threats that can be mapped in the IFAS and EFAS matrices (Rimantho and Marlina, 2021). The analysis of strategic strengths and weaknesses in this study can be seen in Table 1.

	Weight	Rating	Score (Weight x rating)	
Strength	Implementation of Regional Regulations	0.10	2.29	0.23
	regarding waste management			
	There is a financial allocation related to	0.08	2.14	0.17
	household waste management			
	Availability of waste management	0.12	2.79	0.33
	infrastructure provided by the government			

**Table 1.** Internal Strategy Factor System Analysis (IFAS)

				Score
Internal Strategy Factors		Weight	Rating	(Weight
				x rating)
	The existence of waste management	0.07	1.71	0.12
	facilities established independently by the			
	community.			
	There is innovation in waste management	0.12	2.50	0.30
	related to the use of household waste			
	Sub-Total			1.15
Weakness	Failure to enforce regional regulations on	0.12	2.79	0.33
	waste management			
	Lack of financial allocation related to waste	0.08	2.93	0.23
	management			
	Existing waste management facilities are	0.09	3.07	0.28
	inadequate			
	Public awareness in managing waste is still	0.13	3.43	0.45
	low			
	Lack of activity coaching and socialization	0.08	2.50	0.20
	management waste management carried			
	out by the local government			
	Sub-Total	1		1.49
	Q = Strength - Weakness			-0.34

The results of the internal strategic factor analysis in Table 1 show that the strength factor has a total score of 1.15 while the weakness factor has a score of 1.49. Through the results of subtracting the strength factor from the weakness factor, a score of -0.34 is obtained. This indicates that the influence of the weakness factor is greater than the strength factor. So this research is important to study so that the weakness factor can be resolved.

	External Strateory Factors	Weight	Rating	Score
	External Strategy Factors	weight	Raung	rating)
Opportunity	There is support (CSR) from party	0.09	2.00	0.18
opportunity	private	0.07	2.00	0.10
	There is cooperation from organization	0.12	2.50	0.30
	non-profit related management rubbish			
	The existence of waste management	0.08	2.64	0.21
	products that have been marketed			
	There are investors who are interested in	0.11	1.93	0.21
	doing business in the field of waste			
	management			

**Table 2.** External Strategy Factor System (EFAS) Analysis

	There is an opportunity funding from	0.11	2.71	0.30
	Local Government for MSMEs based on			
	management garbage ( Garbage Bank )			
	Sub-Total			1.20
Threat	The existing waste generation has	0.12	2.93	0.35
	disrupted the comfort of people's lives			
	The population is increasing	0.07	2.43	0.17
	Waste management products that are not	0.09	2.43	0.22
	in demand by the public			
	There is no media for promote product		3.07	0.40
	results management rubbish			
	The high cost of waste management	0.08	2.29	0.18
	Sub-total	1		1,32
	Q : Opportunity – Threat			-0,12

Based on results analysis factor strategic external in Table 2 can known that factor opportunity (Opportunity) has total score 1.20 while factor Threat has score 1.32. Through the results of the subtraction of the opportunity factor with the threat factor, a score of -0.12 was obtained. This indicates that the threat factor has a greater influence than the opportunity factor.

The results of the IFAS and EFAS analysis are then depicted in a SWOT diagram to see the quadrant position of the condition of household waste management in Kalianda District so that the right handling strategy can be determined. The SWOT diagram can be seen in



Figure 1. SWOT Analysis Diagram of Household Waste Management in Kalianda District

Based on the results of the SWOT calculation, Household Waste Management in Kalianda District is in quadrant four, with the result that the difference between Strengths and Weaknesses in Internal factors shows a negative value and the difference between Opportunities and Threats in External factors also shows a negative value, so the recommended strategy is the WT (Weakness- Threat) strategy which can be done by creating a strategy that can minimize weaknesses and avoid threats.

The formulation of the WT (Weakness- Threat) strategy in household waste management is based on several pressing problems and strategic issues for waste development in Kalianda District (Arda, 2020). The strategies that can be formulated are as follows;

Strategic Factors			Weakness-Threat Strategy
1. 2.	Failure to enforce regional regulations on waste management Lack of financial allocation for waste management	1.	Enforcing regulations by providing incentives and disincentives to the community in managing household waste (Purwono et al., 2022)
3.	The high cost of waste management	2.	Conducting Optimization of waste retribution and advocacy and socialization to the South Lampung Regency Government Budget Team regarding financing of the waste sub-sector. (Arda, 2020)
1.	Public awareness in managing waste is still low	1.	Conducting socialization of waste utilization and management based on circular economy.
2.	Lack of coaching and socialization activities for waste management carried out by the local government	2.	Conducting monitoring by the government to change public knowledge about waste so that it can overcome the increasing waste problem and prevent people from throwing waste in rivers and coastal areas. (Setiajaya, 2023)
1. 2.	Waste management products that are not in demand by the community Lack of media to promote products resulting from waste management	1.	Conducting market development and information networks related to waste management and waste management products (Purwono et al., 2022)
1. 2.	The existing waste generation has disrupted the comfort of people's lives. Amount the population is increas- ing increase	1. 2.	Develop and implement long-term solutions to address waste and energy issues by making programs related to waste and energy issues a priority. (Nurriskah, 2022) Equalizing waste management facilities and
3.	Existing waste management facilities are inadequate		infrastructure by local governments (Purwono, 2022)

Table 3. SWOT Quadrant Analysis Table

# 4.3 Household Waste Management Strategy Based on Circular Economy

Based on the condition of household waste management in Kalianda District, the Circular Economy-Based Household Waste Management Strategy that can be recommended is the management strategy with the "ReSOLVE" approach developed by the Ellen MacArthur Foundation (2015). This strategy includes six business actions, namely: regenerate, share optimize, loop, virtualize and Exchange .

Resolve framework can help generate recommendations for household waste management in Kalianda District based on the Circular Economy. This ReSOLVE strategy approach can also be used to transform waste management in a company into a Circular Economybased management. (Yosep, 2024). Recommendations for Household Waste Management Strategies Based on the Circular Economy in Kalianda District with the ReSOLVE approach can be seen in the following table 4:

Handling Strategy	Description	Recommendation
Regenerate	<ul> <li>Switching to renewable energy and materials;</li> <li>Restore sustainability ecosys- tem ;</li> <li>Returning recovered biological resources to the biosphere;</li> </ul>	• Utilization of household organic waste to produce biogas as renewable energy (Yoseph, 2024) and compost production as fertilizer (Smol <i>et al</i> , 2020).
Share Share	<ul> <li>Sharing assets (e.g. cars, rooms, equipment);</li> <li>Reuse of products that have neared or reached the end of their useful life;</li> <li>Extend product life through maintenance, design for durability, upgradeability, etc.</li> </ul>	<ul> <li>Maximize use transportation general;</li> <li>Donating or reselling used goods or clothing;</li> <li>Providing promotions/discounts for food products that are nearing the end of their shelf life but are still suitable for consumption (Darmawan, 2023)</li> </ul>
Optimize	<ul> <li>Increase performance / efficiency product;</li> <li>Minimize waste in the production process and chain supply;</li> <li>Leveraging big data, automation, sensing far, and steering.</li> </ul>	<ul> <li>Increase efficiency by repairing electronic equipment so that it can be reused;</li> <li>Recycling inorganic waste such as plastic and metal waste so that it can be used to produce new products.</li> </ul>
Loop	<ul> <li>Remanufacturing prod- uct or components ;</li> <li>Recycle repeat material .</li> </ul>	• Utilization waste organic House ladder For <i>Black Soldier Fly</i> (BSF) larvae cultivation (Bahtiar , 2023), for producing biogas as energy re- newable (yosep , 2024) and pro- duction compost as fertilizer ( smol , 2020) also produces <i>Eco-En-</i> <i>zyme</i> as fertilizers and pesticides natural (Purnamawati, 2023).
Virtualize	• Switch to use goods and also purchase virtually	<ul> <li>Switch use virtual goods in life daily For reduce amount waste produced ( newspapers , books , alarm clocks, music , online shop- ping , etc. )</li> </ul>

**Table 4.** Circular Economy- Based Household Waste Management in Kalianda District using the ReSOLVE approach.

Exchange	• Replacing old products or services with cutting- edge technology and renewable materials	<ul> <li>Replacement of household appliances and goods (such as refrigerators, air conditioners, lamps) based on more environmentally friendly items and energy usage.</li> </ul>

Based on Table 4 above, it can be seen that the recommended strategies are focused on the management and utilization of household waste. In the Regenerate strategy, management focuses on the transition to the use of renewable energy and materials. Yosep (2024) recommends the empowerment of tapioca processing waste to be converted into biogas which can be reused as renewable energy for heating in tapioca production. Smol et al (2020) recommends managing household organic waste such as vegetable scraps, dry leaves, etc. to be processed into compost, this is in accordance with the description of the regenerate strategy to restore ecosystem sustainability and return restored biological resources to the biosphere.

Share strategy focuses on sharing, reusing products that are nearing or end of life and extending the life of products through maintenance, design for durability, upgradability to save energy and minimize waste, such as maximizing the use of public facilities and transportation in an area, so as to save fuel costs. Donation activities or reselling used goods or clothing is also an effective activity for the share strategy, Darmawan (2023) stated that the activity of providing promos/discounts for food products that are nearing the end of their useful life but are still suitable for consumption through the "Surplus" application can reduce food waste (environmental aspect), and become a new business opportunity (economic aspect). This application also indirectly becomes a campaign media for its users to become "green ambassadors" for the surrounding environment, creating social conditions that are more environmentally conscious. In the Optimize strategy, the recommended strategy focuses on improving product performance/efficiency and minimizing waste during the process, as well as utilizing big data, automation, remote sensing, and steering. The recommendation from the Optimize strategy is to increase efficiency by repairing electronic equipment so that it can be reused and recycling inorganic waste such as plastic or metal waste so that it can be used to produce new products.

Loop handling strategy can be associated with keeping the flow of components and materials closed, meaning that waste or by-products must be reused. The act of reusing waste, in this case household waste, is not limited to the reuse of inorganic waste only, this action can of course also be carried out on organic waste, where utilization can be carried out such as cultivating Black Soldier Fly (BSF) larvae (Bahtiar, 2023), compost processing for use as fertilizer (Smol, 2020), inorganic processing is carried out to produce biogas that can be used as renewable energy (Yosep, 2024), and Eco-Enzyme processing which can be used as fertilizer and natural pesticides (Purnamawati, 2023).

Virtualize handling operation strategy is an operation that assumes the provision of certain utilities virtually rather than materially. This can help reduce the amount of household waste produced by residents. Examples of activities that can be done include switching to using virtual items but still have the same function, such as watches, calculators, cameras, flashlights and replacing paper newspapers and books with online magazines and e-books, thereby reducing paper use and reducing paper waste. Buying and selling activities can also be diverted to virtual activities through e-commerce applications.

Exchange handling strategy focuses on replacing old materials with new materials that are sophisticated and use modern technology. This refers to replacing household appliances and other items such as refrigerators, freezers, air conditioners, lights and other items where these items already have more environmentally friendly versions with lower energy consumption

# 5. Conclusion

Household waste management in Kalianda District still faces various serious challenges. From the existing conditions, it was found that public awareness in managing waste is still low, waste transportation and management management is not optimal, the role of waste institutions is not yet effective, and the implementation of Regional Regulations on waste is not yet optimal. SWOT analysis shows that the weakness and threat factors are more dominant than the strengths and opportunities, so the strategy needed is the WT ( Weakness-Threat) strategy to minimize weaknesses and avoid threats. The strategy includes increasing law enforcement, optimizing waste levies, increasing public awareness through socialization based on the circular economy, building a network of information on waste management products, and developing adequate waste management facilities. As a more sustainable solution, the Circular Economy approach with the ReSOLVE strategy (Regenerate, Share, Optimize, Loop, Virtualize, Exchange) is recommended. This includes the utilization of organic waste for renewable energy and fertilizer, promotion of product reuse, waste efficiency and recycling, to digitalization of services to reduce waste. With the implementation of this strategy, it is hoped that household waste management in Kalianda District can be more effective, sustainable, and support environmental conservation.

# Reference

- [1] M. Arda, D. Andriany, and Y. H. Manurung, "SWOT Analysis in Determining Household Waste Management Strategy in Medan City," Proc. Nat. Conf. Manage. Econ. Account. (KNEMA), vol. 1, no. 1, 2020.
- [2] R. Babu, P. M. Veramedi, and E. R. Rene, "Strategies for resource recovery from the organic fraction of municipal solid waste," *Case Stud. Chem. Environ. Eng.*, vol. 3, 2021, Art. no. 100098, doi: 10.1016/j.cscee.2021.100098.
- [3] Central Bureau of Statistics, South Lampung Regency in Figures. Kalianda: Central Bureau of Statistics of South Lampung Regency, 2023.
- [4] R. Bahtiar, F. D. Raswatie, and W. Afriana, "Utilization of clam shell waste through circular economy activity in Tangerang Regency coastal area," in *IOP Conf. Ser.: Earth Environ. Sci.*, vol. 1260, no. 1, p. 012025, Nov. 2023.
- [5] K. Brendzel-Skowera, "Circular Economy Business Models in the SME Sector," Sustainability, vol. 13, p. 7059, 2021, doi: 10.3390/su13137059.
- [6] S. N. Halizah and D. Darmawan, "Development entrepreneurship intention as an effort to improve the level of the consumer household economy," Bull. Sci. Technol. Soc., vol. 2, no. 1, pp. 21–25, 2023.
- [7] Ellen MacArthur Foundation, Towards the Circular Economy: Economic and Business Rationale for an Accelerated Transition. 2015. [Online]. Available: <u>https://www.ellenmacarthurfoundation.org/publications/towards-the-circulareconomy-volume-1-an-economic-and-business-rationale-for-an-acceleratedtransition</u>
- [8] Z. Mamashli and N. Javadian, "Sustainable design modifications municipal solid waste management network and better optimization for risk reduction analyses," *J. Clean. Prod.*, vol. 279, 2021, Art. no. 123824, doi: 10.1016/j.jclepro.2020.123824.
- [9] Y. D. Nurriskah and S. Marmoah, "Implementation SWOT analysis in Planning Improvement Management Environment Based on Green Behavior in Elementary Schools," DWIJA CENDEKLA: J. Pedagog. Res., vol. 6, no. 2, pp. 394–401.
- [10] I. G. A. Purnamawati, K. R. Suwena, and K. K. Heryanda, "The Use of Digital Finance Applications, Competitiveness, and Green Economy on Village Development," Int. J. Organ. Behav. Policy, vol. 2, no. 2, pp. 67–76, 2023.
- [11] P. Purwono, W. R. Adawiyah, and E. Suyanto, "Management Strategy Household Waste With Circular Model In Urban Areas Purwokerto," Bull. Public Health, vol. 41, no. 3, pp. 108–115, 2022.
- [12] D. Rimantho and T. Marlina, "Proposed Solid Waste Management Strategy at Bekasi Landfill with SWOT and AHP Approach," J. Environ. Sci., vol. 19, no. 2, pp. 383–391, 2021.
- [13] L. Schröder et al., "Gridded surface elevation changes from multimission satellite altimetry 2017," *PANGAEA*, vol. 13, no. 2, pp. 427–449, 2019.
- [14] A. Setiajaya, S. Hasiany, and A. S. Zulaicha, "Household Waste Management Strategy in Bandar Lampung City (Case Study: Sukaraja Village)," J. Knowl. Environ., vol. 21, no. 4, pp. 807–818, 2023.
- [15] M. Smol, C. Adam, and M. Preisner, "Circular economy model framework in the European water and wastewater sector," J. Mater. Cycles Waste Manage., vol. 22, pp. 682–697, 2020.
- [16] K. Winans, A. Kendall, and H. Deng, "The History and Current Applications of The Circular Economy Concept," Renew. Sustain. Energy Rev., vol. 68, no. 1, pp. 825–833, 2017.
- [17] P. R. Yaashikaa, P. S. Kumar, A. Saravanan, S. Varjani, and R. Ramamurthy, "Bioconversion of municipal solid waste into bio-based products: A review on valorisation and sustainable approach for circular bioeconomy," *Sci. Total Environ.*, vol. 74, pp. 1–12, 2020.
- [18] Y. Yosep, U. Mulkhan, U. Hasanudin, and D. A. Iryani, "Unleashing the Sustainable Transition of Circular Economy: A Case Study of SMEs Tapioca Industry in Lampung, Indonesia," *Circ. Econ. Sustain.*, pp. 1–20, 2024.
- [19] Y. Yosep, U. Mulkhan, U. Hasanudin, and D. A. Iryani, "Unleashing the Sustainable Transition of Circular Economy: A Case Study of SMEs Tapioca Industry in Lampung, Indonesia," 2024. [Online]. Available: <u>https://doi.org/10.1007/s43615-024-00358-6</u>