

#### Article

# Strategy on circular economy transition: A case study of agrocompany in Indonesia

#### Sri Setiawati Tumuyu<sup>\*</sup>, Lusye Marthalia

School of Environmental Science, University of Indonesia, Jakarta 10430, Indonesia \* **Corresponding author:** Sri Setiawati Tumuyu, sri.setiawati11@ui.ac.id

#### CITATION

Tumuyu SS, Marthalia L. (2024). Strategy on circular economy transition: A case study of agrocompany in Indonesia. Journal of Infrastructure, Policy and Development. 8(1): 3021. https://doi.org/10.24294/jipd.v8i1.30 21

#### ARTICLE INFO

Received: 13 October 2023 Accepted: 13 November 2023 Available online: 15 December 2023

#### COPYRIGHT



Copyright © 2023 by author(s). Journal of Infrastructure, Policy and Development is published by EnPress Publisher, LLC. This work is licensed under the Creative Commons Attribution (CC BY) license. https://creativecommons.org/licenses/ by/4.0/

Abstract: The Circular Economy (CE) concept has been recognized as the core strategy that can support sustainable business through technological innovation that enables CE transition by focusing on resource savings. This case study conducts research on business strategy in achieving CE transition in an agroindustry company, by performing SWOT analysis to assess internal and external factors. The SWOT model provides valuable results that an effective strategy could maximize strengths and opportunities, minimize weaknesses and threats in business by boosting circularity on business-critical factors. The CE adoption by agroindustry company mostly focuses on efficient organic waste management, energy-efficient production, and production process. This study case reveals that while technology plays a significant role in advancing CE, there is still a significant need to pay attention to the social aspect in supporting the creation of worker-owned cooperatives by creating space for employee involvement in finding innovations and adopting technology in business transition into CE process. Social innovation through the involvement of employees by sharing CE vision, synergizing and optimizing internal potential, and building up the green innovation culture has created an internal conducive climate to put CE principle into practice. Further result shows that a labor-intensive company's business strategy prioritizes employment and job security over maximizing profits, which directly leads to the economic welfare and social protection of the business operation that makes an inclusive business.

**Keywords:** circular economy; sustainable business; social innovation; strategic evaluation; SWOT; agroindustry

## 1. Introduction

Since the 1990s, the Circular Economy (CE) concept has been recognized as the core strategy for sustainable business, as technological innovation enables CE transition that focuses on resource savings (Boons & Lüdeke-Freund, 2013). The CE approach has been considered to put a comprehensive transition to sustainable business, by making the business sector rethink their business, comprehending and exploring more existing opportunities. This approach also changes a business mindset on making the target, value chain creation and working methods (Hotta et al., 2021). The business sector has an important role in CE implementation by carrying out business model innovations, referring to the circularity principle that can contribute to sustainable development. The concept of business as usual (BAU) is considered no longer relevant, therefore the CE framework can be used as an effective sustainable alternative in combining nature with man-made systems (Rótolo et al., 2022).

Business commitment can be increased through solutions on sustainable production and changes towards CE framework that require significant changes in consumption behavior and followed by production patterns (Jones & Wynn, 2021).

The application of CE principles at the micro level is gaining recognition as the new approach in the business sector that can drive strategic initiatives in improving production systems in the supply chain to achieve an efficient and economical closed circulation cycle (Kowalski & Makara, 2021) and further spur significant improvements in sustainability (Nuñez-Cacho et al., 2018). A recent global survey found that integrating CE application into business can boost innovation, help companies become more efficient and competitive in many areas such as resource management, product development, and production processes (WBCSD, 2018). From the social aspect, within internal (Penz & Polsa, 2018; Sukhonos et al., 2018) and external (Padilla-Rivera et al., 2020) stakeholder participation, CE adoption plays an important role in addressing problems that arise from business operational activities as acceptable, transparent, and multi-orientation ways that enable innovation for circularity. The implementation of CE framework that focuses on environmental improvement made good business and business increasingly use CE as their strategic approach (Donner & de Vries, 2021; PWC, 2015).

The CE adoption in business should align with sustainable production initiatives and relate to green innovation (EMF, 2013; Ketels & Protsiv, 2017), and can be implemented in various business activities and diverse business models (EU Report, 2017). Agroindustry is also considered as the business sector that should adopt CE based on its large consumption of water and energy during the production process (Klein et al., 2022), and more importantly, the output of organic waste and flow of byproducts could pose serious challenges to the environment. The agroindustry supply chain itself has the potential to be developed for further investment, to be more sustainable and circular, resource recovery attention through closed-loop supply chains (Poponi et al., 2022), and external resource exchange as complementary activities, such as agriculture or animal husbandry (Jouan et al., 2020). Agroindustry closely related to agriculture and food has significant potential for low-carbon transition and climate-friendly economy initiatives, like handling Food Loss and Waste/FLW and as the important contributor to overall waste production (Mehmood et al., 2021). The business-added value within the circularity framework of agroindustry has become clearly important based on its high dependency on nature which has many changes nowadays (Donner & de Vries, 2021).

AgroInc company is one of the national agroindustry companies in Indonesia that has put CE principles in its strategy and has been operating since the 1970s in the Sumatera area. AgroInc has quite a large land for fresh fruit cultivation and other rotational crops for the production of canned fruit products and juice concentrates exported to other countries. AgroInc made the CE principles as the framework reference for the business through the application of an integrated farming system, as an interaction between various agricultural components such as fresh fruit production, animal farming and other natural resources in the integrated system. AgroInc strives to make maximum use of all crops by adopting the latest environmentally friendly technology to increase efficiency and effectiveness in each production process. The CE adoption at AgroInc began with an initiative to manage their organic waste from plantation crops, using an integrated agricultural system and has the zero-waste target as their mission. AgroInc's transition to a CE involves fundamental changes in how the company's produces, uses, and utilizes resources. Although this approach aims to reduce negative impacts on the environment and create long-term sustainability, there are many challenges and problems faced in its implementation. AgroInc is also facing challenges in ensuring their internal (managers and employees) involvement during CE implementation and considering the external factors that influence it. The AgroInc corporate innovation within CE framework leads to economic benefits, environmental protection and an increase in social acceptance, however it needs to be seen further as an evaluation of the company's strategy. This research shows a strategic evaluation of business practices of the CE concept and could pose as the business practices learning.

## 2. Review of literature

The "Circular Economy" (CE) term was introduced by David Pearce and Kerry Turner in 1989 (EMF, 2013) by modeling an economy that applies a material equilibrium model following the first and second laws of thermodynamics. In this model of material equilibrium, everything used in economic activity is considered an input (natural resources, labor, or capital), after being processed and converted into goods and services, the result is viewed as an output. This model seeks to achieve a balance between inputs and outputs by paying attention to environmental aspects. The CE conceptualization on industrial activities is carried out by minimizing resource inputs, waste, emissions and energy leakage by integrating the design strategies that promote durability, effective maintenance, repair, reuse, remanufacturing, repair and recycling (EMF, 2013; Hartwell et al., 2021). The extent of CE implementation depends on the application context in which CE framework is carried out, and this research puts attention on the perspective of the microsystem that focuses on products, businesses, and consumers (Kristensen & Mosgaard, 2020). CE in the production process is defined as the regenerative system in which resource inputs, waste, emissions, and energy leakage are minimized by slowing, closing, and narrowing the energy and material loop. This can be achieved by adopting CE practices through durable design, maintenance, repair, reuse, remanufacturing, repair, and recycling (PACE, 2020).

Business transformation towards a CE adoption requires attention to several important matters, such as; materials and product design, new business models, and conducive driving factors (Amir et al., 2023), and on the other hand rely on the introduction of the circularity concept into strategies by the business entities (EMF, 2015). The management activities are based on managerial decisions aligning the company's vision and strategy with forming the company's business model and organizational development. Nevertheless, unsustainable management decisions that ignore social and environmental problems can hinder the company's progress. Companies usually use one or two business model alternatives for the corporate strategies in shaping transformations, however, it is necessary to ensure that the business model structure can explore new ways to create and deliver sustainable value and provide new business opportunities (Corona et al., 2019; Padilla-Rivera, 2020). A future orientation to the sustainable business agenda requires a holistic approach among various initiatives and provides the right decision-supporting tools to support the transition trajectory toward the end goal. Transition management in changing business circularity needs to change dominant cultures, unsustainable system structures and practices by linking innovation mindsets at the micro level, therefore involvement from actors, especially internal stakeholders (management and employees) can be put as a social focus approach as intervention-based on experimentalism (Wittmayer et al., 2020), more broadly it can be put as the conception of social innovation that allows for broader planning and improvement of structural systems.

Placing CE concept as the "heart" of the business model (Bansal et al., 2020), it is crucially necessary to first identify and comprehend the key factors that determine business success, analyze the economic impact of the business model and then how to carry out the CE initiatives. Furthermore, the chosen company's overall strategy to achieve the sustainability concept can be seen in the adoption of the business innovation model that is being developed, namely a) defensive strategy, with a slight adjustment to the new business model adoption, which may only be motivated by the need to comply with laws and protect the current business model; b) accommodative strategies, in line with changes and improvements in the business models that are addressing environmental and social objectives; c) proactive strategies, leading to a redesign of the business model and fully integrating sustainability issues in the company's products and operational processes (Donner & de Vries, 2021). Furthermore, the SWOT (Strengths, Weaknesses, Opportunities and Threats) analysis method can be used as a strategic assessment tool by collecting and organizing the information needed to evaluate the positive (strengths, opportunities) and negative (weaknesses, threats) elements of a strategy, project, business model, company, or industry (Teece, 2017). There is a strong assumption that an effective strategy will maximize strengths and opportunities and minimize the weaknesses and threats of an organization (Sanny et al., 2018). The strength at the micro level can manifest in its resources (finance, human, energy, machinery, buildings and so on) as well as unique, distinctive skills or advantages. The strength assessment can also be called the core that distinguishes the organization from other competencies. Weakness can be seen as limited resources in terms of expertise, number and capability that hinder company performance and competence, revenue benefits, managerial and product improvement. Opportunity is an important situation or condition that benefits the company, so this aspect needs to be considered by the business sector in achieving its targets and goals. Threats are unfavorable situations or conditions that cannot be eliminated or corrected, can hinder progress and are not beneficial for business.

SWOT models can be useful as a systematic comparison between external factors on opportunities and threats with the organizational weaknesses and strengths, that are being identified as one of significant organizational situations or strategy patterns (Padash & Ghatari, 2020; Sanny et al., 2018). The SWOT results analysis in this study can have three benefits (Pesce et al., 2018); 1) identifying aspects that define the CE implementation within the company, 2) assessing the benefits of CE adoption to achieve and sustain factors in terms of sustainability (environmental, social and economic), internal processes, stakeholder relationships and resource management and 3) understanding the prospects of CE adoption through innovation and corporate sustainability approach. The strategic analysis is based on evaluating internal and external factors (IE) from SWOT analysis. The SWOT matrix results are being used as a tool to evaluate the current state of the company, which is developed into four types of strategies (Padash & Ghatari, 2020), each of these strategies has its characteristics and can support each other;

- SO (Strengths-Opportunities) strategy; this category contains various alternative strategies that take advantage of opportunities by utilizing their strengths. In the SO strategy, the company uses all its internal strengths to take advantage of external opportunities.
- 2) WO (Weaknesses-Opportunities) strategy, is a category that takes advantage of external opportunities to overcome weaknesses. WO strategy requires further development of internal weaknesses.
- 3) ST (Strengths-Threats) strategy, requires a strategy that leverages strengths to overcome threats.
- 4) WT Strategy (Weaknesses-Threats).

#### 3. Methodology

The qualitative approach is being used for this article with combined research methods. Qualitative method is being used to collect and process information from informants, as well as in presenting analysis. On the other hand, quantitative method is used to determine the factors that influence CE adoption and to quantify the evaluation of the company's CE transition strategy. References to the CE study at the micro level are still limited, and this study focuses on business analysis (Gorissen, 2016; Donner & de Vries, 2021) using the SWOT analysis method (Padash & Ganthari, 2020). Data was collected through semi-structured interviews with the key stakeholders from internal and external for conducting SWOT analysis in this study. The stakeholders were interviewed to explore the different dimensions of informants' experiences, views, and perspectives on AgroInc's transition to implement CE, particularly regarding CE adoption practices and achieving sustainable business transformation.

#### 4. Findings

The results of SWOT analysis on business strategy carried out by AgroInc company as the case study, have an aggressive strategy in adopting a CE framework. AgroInc has the biggest strength in capabilities in the resource and material management within their business operations through technological and social innovation that involve internal stakeholders (management and employees) by sharing CE vision, synergizing and optimizing internal potential, and building up the green innovation to put CE principle into practice. The company's strategic action toward CE transformation is through communicating the company's vision, structuring technical and practical problems and finding the root cause of problems by sharing and bringing together diverse perceptions and knowledge to develop innovation. In this regard, the learning organization and innovations carried out by AgroInc is embodied in the company's strategic vision. The CE adoption at AgroInc can be achieved through pro-environmental workplace behavior, which is indirectly influenced by perceived behavior control, information needs and social norms. Social norms are also indirectly influenced by attitude and environmental awareness (Banwo and Du, 2019; Fawehinmi et al., 2020).

Another AgroInc's strength lies in its consideration of technology that still requires manual labor, providing social protection for the company. The surrounding community where the company operates has become an internal part of the company due to the choice of technology. The community employment and empowerment strategy helps reduce regional unemployment which has a widespread impact on lowering crime rates. The business transition has captured the business opportunities through green innovation initiatives, and building up the business's competitive advantage. AgroInc's CE adoption strategy has positioned the company with a competitive advantage in economic aspects, socially acceptable and environmental protection. From an economic aspect, AgroInc's business model utilizes the CE concept to create additional value-added, competitiveness and creating new jobs. The implementation AgroInc's eco-efficiency business model has resulted in significant cost savings from reduced operational expenses, including water and energy costs. A business strategy focusing on eco-innovation emphasizes technological innovation's duality and environmental protection as long-term solutions (Zhu et al., 2022). In the environmental aspect, AgroInc's sustainability strategy focuses on resource management through organic waste management and regenerating the natural systems on soils through supporting methods and using organic fertilizers. AgroInc's sustainability performance on social aspects can be seen in the company's contribution to employee welfare and society through various employee programs and community empowerment programs. The result identification of company's SWOT is in Table 1.

1.Capabilities in managing organic waste from the company's horticultural production1.Lack of supply chain (vendor) involvement company's horticultural production2.Level of innovation through the creation of new ideas or reconfiguration of existing business practices3.Incompatibility of business development plans with CE innovations3.Put attention on energy efficiency and the use of renewable energy4.The flow of materials using efficient, biological and cyclical raw materials4.The inability of HR capacity to apply CE technology 5.5.Water management in operational processes 6.6.Minimum cooperation and dialogue with local governments6.The leadership vision focuses on balancing sustainability elements7.Consistent efforts are needed to change employees' mindset7.Top management's commitment in terms of financial support and research development8.Lack of reference to CE practices at the micro level 9.9.Capacity building on HR for employee0.Internal award competition at AgroInc for the initiative on sustainability action11.Open corporate culture in new things 12.11.High costs are required for CE adoption13.Attention to the health, safety and social welfare of employees11.	Strength	Weakness
support and research development9.Need a great effort to encourage employee motivation8.Availability of guidelines for CE initiatives at AgroInc10.Change of ownership of the company(SOP/Guidelines/Procedures)11.High costs are required for CE adoption9.Capacity building on HR for employee11.10.Internal award competition at AgroInc for the initiative on11.11.Open corporate culture in new things12.12.Eligibility of many global certifications13.13.Attention to the health, safety and social welfare ofemployees	<ol> <li>Capabilities in managing organic waste from the company's horticultural production</li> <li>Level of innovation through the creation of new ideas or reconfiguration of existing business practices</li> <li>Put attention on energy efficiency and the use of renewable energy</li> <li>The flow of materials using efficient, biological and cyclical raw materials</li> <li>Water management in operational processes</li> <li>The leadership vision focuses on balancing sustainability</li> </ol>	<ol> <li>Lack of supply chain (vendor) involvement</li> <li>Not much attention to product design</li> <li>Incompatibility of business development plans with CE innovations</li> <li>The inability of HR capacity to apply CE technology</li> <li>The reluctance of the AgroInc's management to promote their CE initiatives</li> <li>Minimum cooperation and dialogue with local governments</li> <li>Consistent efforts are needed to change employees'</li> </ol>
14. Economic benefits of CE adoption	<ul> <li>support and research development</li> <li>8. Availability of guidelines for CE initiatives at AgroInc (SOP/Guidelines/Procedures)</li> <li>9. Capacity building on HR for employee</li> <li>10. Internal award competition at AgroInc for the initiative on sustainability action</li> <li>11. Open corporate culture in new things</li> <li>12. Eligibility of many global certifications</li> <li>13. Attention to the health, safety and social welfare of employees</li> </ul>	<ul><li>9. Need a great effort to encourage employee motivation</li><li>10. Change of ownership of the company</li><li>11. High costs are required for CE adoption</li></ul>

Table 1	I. (Cont	inued).
---------	----------	---------

Opportunity		Threats	
1.	Increasing attention to environmental protection	1.	External pressure from buyers lacks of
2.	Contribution to national emission reduction	government in	ncentive support
targets		2.	Short-term political cycles
3.	Collaboration with universities and research	3.	Climate change and weather factors
institutions		4.	Foreign policy factors business competition
4.	Compliance with government regulations		
5.	Community empowerment		
6.	Corporate social responsibility and business		
ethics			
7.	The company's vision as a labor-intensive		
company			
8.	Increasing employment opportunity		
9.	As the learning innovation practices for other		
industries			

#### 5. Discussion

The assessment of the evaluation of AgroInc's strategy in implementing CE uses quantitative SWOT analysis as a tool to evaluate the strategy adoption that AgroInc has implemented. The strategic analysis approach is based on evaluating internal and external factors (IE) from SWOT analysis. In this regard, the strength (S) is mentioned as a positive attribute of AgroInc's CE adoption that strengthens the company's business performance. Weakness (W) describes negative attributes that weaken AgroInc's business performance. Opportunities (O) are defined as external, positive or attractive factors that are being brought to the AgroInce CE adoption. Threats (T) are external negative factors over the CE adoption y that may put AgroInc's business at risk. The factor identification from interviews resulting from informants and being adjusted to SWOT factors can be seen in Table 1. Based on SWOT analysis, the weight and rating calculations are made as an evaluation basis for CE adoption strategies at AgroInc. The weight value is based on the scale numbers of 0 to 1 as the accumulation of strengths and weaknesses and the accumulation of opportunities and threats. Weighting value is based on factors often mentioned during interviews and considered important to informants. Rating value is based on AgroInc's level of influence and other references like Corporate Reports and corporate documentation. The calculation of the weight score in IFAS (Internal Factor Analysis Summary) is generated from the multiplication of the weight value by the rating with the details in Table 2.

	Internal factor	Weight	Rating	Score
Strer	ngth			
S1	Serious attention to organic waste management from the company's production to reduce environmental pollution while getting added value for the company	0.055	4.0	0.220
S2	Good level of innovation with the creation of new or upgraded technology in business processes even for the creation of new business units or products/Capacity in Innovation, R&D		3.8	0.209
<b>S</b> 3	Intensive attention to energy efficiency and the use of renewable energy initiatives	0.045	3.9	0.176
S4	Attention to material flow by using efficient and biologically cyclical-friendly raw materials	0.045	3.6	0.162

Table 2. IFAS (Internal Factor Analysis Summary).

## Table 2. (Continued).

IFAS

	Internal factor	Weight	Rating	Score
Stren	gth			
S5	Water handling in operational processes, such as water saving and waste management	0.040	3.7	0.148
S6	Strong leadership vision by focusing on balancing sustainability aspects	0.055	3.8	0.209
S7	Top management's commitment to the adoption of circular economy initiatives in terms of funding, research and development and the establishment of a sustainability division in 2018	0.055	4.0	0.220
S8	There are special guidelines related to the initiatives to implement a circular economy for managers and employees, for example SOPs/Guidelines/Procedures for handling organic waste	0.055	3.5	0.123
S9	Employee HR capacity building through training, periodic retraining related to SOPs/Guidelines as well as discoveries on CE adoption	0.050	3.4	0.170
S10	Family corporate culture and open acceptance of innovation	0.045	3.6	0.162
S11	The company's efforts to meet environmental criteria as certification requirements to penetrate the global market	0.040	3.5	0.140
S12	Attention to the employee health, safety and social welfare of employees	0.046	3,7	0.170
S13	The economic benefits are related to cost-saving through existing innovations and the increasing streams for businesses with new products resulting from circular economy innovations	0.045	4.0	0.180
S14	Support for technology infrastructure facilities (in-house laboratories)	0.055	3.2	0.176
S15	Availability of funding systems or capital to support innovation	0.045	3.2	0.144
S16	Support for building up the business development mechanisms to support the visibility of economic calculations	0.035	3.4	0.119
S17	An award and recognition to employees for supporting the CE adoption in the company	0.040	3.5	0.140
	Total Strength	-	-	2.867
Weak	ness			
W1	Involvement with supply chains, especially vendors, is still normative, not yet at the stage of involvement in efforts to improve resource management	0.030	1.8	0.054
W2	Attention to product design as a corporate responsibility for consumer health and safety is limited only to meet the buyer standards	0.020	1.5	0.030
W3	Mismatch of business development plans of circular economy innovation with implementation in the field	0.024	1.7	0.040
W4	Lack of capability of Human Resources/HR in CE implementation and technology transfer (incompetent expertise)	0.020	1.1	0.022
W5	The reluctance of company management to promote their CE circular economy practices	0.010	1.9	0.019
W6	Minimum cooperation and dialogue with local governments, currently cooperation with the government is still normative	0.020	1.5	0.030
W7	Consistent efforts are needed in changing employees' mindset on CE initiatives that are important for companies	0.030	1.2	0.036
W8	Lack of references for circular economy practices at the micro and similar industry levels that companies can learn	0.010	1.3	0.013
			1.6	0.032
W9	Need great effort to encourage employee motivation and generate ideas that can innovate CE adoption	0.020	1.6	0.052
W9			1.6 1.4	0.014
	innovate CE adoption Change of ownership of the company from a family company to a public company	0.010		

2.546

-

-

The calculation of the weight score in EFAS (Internal Factor Analysis Summary) is also generated from the multiplication of the weight value by the rating with details that can be seen in **Table 3**.

	External factor	Weight	Rating	Score
Oppo	rtunity			
01	Increase attention on environmental protection through the adoption of a CE corporate initiatives such as waste handling, energy, material flow and others	0.0965	3.8	0.367
O2	Contribute to national emission reduction targets through CE adoption and calculating the value of the company's carbon footprint	0.0730	4.0	0.292
03	Collaboration with universities for research and development	0.0750	3.4	0.255
O4	Compliance with government regulations, especially environmental and labor regulations	0.0800	3.6	0.288
05	Community empowerment from CE design (coaching, mentoring and partnership programs)	0.0930	3.5	0.326
06	Fostering good relations with the surrounding community through inclusive CSR programs with corporate businesses such as stunting eradication through the provision of nutritious foods such as milk and fruits	0.0850	3.8	0.323
07	The company's vision as a labor-intensive company can contribute to the regional social and economic welfare	0.0910	3.9	0.355
<b>2</b> 8	Increasing employment opportunities by recruiting local people as employees, day laborers and casual laborers and has an impact on overcoming society's social problems, especially in reducing crime rates	0.0890	3.8	0.338
<b>C</b> 9	Play a role as the sample of innovation practices for CE business adoption for similar industry	0.0710	3.4	0.241
	Total Opportunity			2.785
Threa	ats			
Γ1	External pressure from buyers and consumers to meet export standard certification, so the main motivation is not for environmental protection	0.0300	0.8	0.024
Г2	Lack of government incentive support for CE adoption, especially in the field of renewable energy	0.0560	1.8	0.101
Г3	Short-term political cycles such as the change of regional leaders in 5 years or officials authorized to handle CE-related policies	0.0500	1.7	0.085
Г4	Climate change and weather factors that are very influential for agro-industry	0.0330	0.9	0.030
Г5	Foreign policy factors due to export-oriented companies	0.0350	1.5	0.053
Г6	Business competition with similar businesses from within and outside the country	0.0420	1.6	0.067
	Total Threats	1.000		0.359
	Matrix EFAS			2.426

Table 3. EFAS (External Factor Analysis Summary).

The result of strategic evaluation using SWOT matrix analysis has a total IFAS (Internal Factor Analysis Summary) score of 2.546 and a total EFAS (External Factor Analysis Summary) score of 2.718, that can be seen in **Table 4** which show the results of SWOT score details. The result of X and Y is located on the right-above quadrant, which can be seen **Figure 1**.

 Table 4. SWOT score details.

Internal factor External factor		
	Internal factor	External factor



Figure 1. SWOT quadrant matrix.

Based on the results of matrix SWOT quantification, strengths are more significant than weaknesses and opportunities are more significant than threats, which places the company's position in the right quadrant that focuses on the SO/strength opportunity strategy as an aggressive strategy, using internal strengths to take advantage of external opportunities (Susanto, 2022). The business strategy run by the company is considered to have an aggressive strategy with elements;

- The design of the company's management system is based on the concept of sustainability, although at first, the company did not have initial planning related to the CE, in its journey the company made a strategic step by forming a particular function or division headed by a director at the top-management level. This division has the role of making sustainability designs within the company, finding new technologies and innovations that can help improve organizational performance and cross-coordination between company divisions.
- The corporate business model innovation involves changing the company's operational process activities, paying attention to internal process design, and modifying practices relevant to the company's business process in obtaining economic and environmental benefits for the development of organizational stakeholders.
- Transformation of the company's vision and mission involves rethinking what the company is currently doing to improve its organizational performance.

The assessment of circular business models in agroindustry was deemed successful based on consideration of managerial arrangements that focus on handling organic waste and valorization of by-products. The AgroInc management adjusts internal regulation by paying attention to external factors that influence it. The business that reaches a high level of circularity, has a strong partnership approach within its wider business ecosystem, with a reciprocal relationship between actors within the company (Donner & de Vries, 2021). Therefore, AgroInc can be considered as an agro-industrial company that has successfully adopted CE and has strong sustainability values in its business operations.

## 6. Conclusion

In the context of agrobusiness, most CE innovative adoption focuses on organic waste handling, resources and energy efficiency, and attention to material flow. Referring to the results of the SWOT analysis regarding the business strategy that was carried out by AgroInc company as the case study, have an aggressive strategy in adopting a CE framework. AgroInc's has two most significant strength. Firstly, they have excellent capabilities in resource and material management, allowing them to capture business opportunities effectively. Secondly, they foster the creation of worker-owned cooperatives in transitioning business into CE process. This is achieved by involving employee in finding innovative solution and adopting technology within the industrial environment. AgroInc's adoption of CE has positioned them to have a competitive advantage in economic, social and environmental aspects due to their green innovation initiative. It's essential to strike a balance between technological progress and maintaining a secure and well-supported workforce by putting attention on improving and empowering human resources into corporate sustainability action by sharing incentives and providing a creative and condusive environment. Different approaches may be more or less suitable depending on the specific social and economic context of the business, country or region. Moreover, these strategies can be combined and tailored to suit the unique challenges and opportunities in different areas. The business should focus on equitable economic development that benefits all segments of society, including promoting inclusive business.

Author contributions: Conceptualization, SST and LM; methodology, SST and LM; software, LM; validation, SST and LM; formal analysis, SST; investigation, SST and LM; resources, SST and LM; data curation, SST and LM; writing—original draft preparation, SST and LM; writing—review and editing, LM; visualization, SST and LM; supervision, SST; project administration, LM; funding acquisition, SST. All authors have read and agreed to the published version of the manuscript.

Acknowledgments: The authors gratefully acknowledge the financial aid provided by the University of Indonesia through Hibah Riset Universitas Indonesia 2030, PUTI Pascasarjana 2023. The authors also would like to greatly acknowledge all the informants and respondents from the study case company for their assistance and support.

Conflict of interest: The authors declare no conflict of interest.

## References

Amir S, Salehi N, Roci M, et al. (2023). Towards circular economy: A guiding framework for circular supply chain implementation. *Business Strategy and the Environment* 32(6): 2684–2701. doi: 10.1002/bse.3264

Bansal AK, Das G, Pandey S, et al. (2020). Implementation of sustainable green technologies in waste management. In: *Green Innovation, Sustainable Development, and Circular Economy*. CRC Press. pp. 115–128.

- Banwo AO, Du J (2019). Workplace pro-environmental behaviors in small and medium-sized enterprises: An employee level analysis. *Journal of Global Entrepreneurship Research* 9(1): 1–20. doi: 10.1186/s40497-019-0156-4
- Boons, Frank., Lüdeke-Freund, Florian. (2013). Business models for sustainable innovation: state-of-the-art and steps towards a research agenda. *Journal of Cleaner Production*, 45 (2013) 9e19.
- Corona B, Shen L, Reike D, et al. (2019). Towards sustainable development through the circular economy—A review and critical assessment on current circularity metrics. *Resources, Conservation and Recycling* 151: 104498. doi: 10.1016/j.resconrec.2019.104498
- Donner M, de Vries H (2021). How to innovate business models for a circular bio-economy? *Journal of Business Strategy Environment* 30(4): 1932–1947. doi: 10.1002/bse.2725
- EMF/Ellen MacArthur Foundation (2015). Indicators—An Approach To Measuring Circularity-Project Overview. EMF.
- EMF/Ellen Macarthur Foundation (2013). *Towards The Circular Economy, Economic and Business Rationale for An Accelerated Transition.* Ellen Macarthur Foundation.
- EU/European Parliament Report (2017). REPORT on EU action for sustainability 27.6.2017 (2017/2009(INI). EU Publication
- Fawehinmi O, Yusliza MY, Mohamad Z, et al. (2020). Assessing the green behaviour of academics: The role of green human resource management and environmental knowledge. *International Journal of Manpower* 41(7): 879–900. doi: 10.1108/ijm-07-2019-0347
- Gorissen, L., Vrancken, K., Manshoven, S. (2016). Transition Thinking and Business Model Innovation—Towards a Transformative Business Model and New Role for the Reuse Centers of Limburg, Belgium. *Journal of Sustainability* 8, 112. MDPI
- Hartwell R, Macmillan S, Overend M (2021). Circular economy of façades: Real-world challenges and opportunities. *Journal of Resources, Conservation & Recycling* 175: 105827. doi: 10.1016/j.resconrec.2021.105827
- Hotta Y, Tasaki T, Koide R (2021). Expansion of policy domain of sustainable consumption and production (SCP): Challenges and opportunities for policy design. *Sustainability* 13(12): 6763. doi: 10.3390/su13126763
- Jouan J, Ridier A, Carof M (2020). Synergy: A regional bio-economic model analyzing farm-to-farm exchanges and legume production to enhance agricultural sustainability. *Ecological Economics* 175: 106688. doi: 10.1016/j.ecolecon.2020.106688
- Jones P, Wynn MG (2021). The circular economy, resilience, and digital technology deployment in the mining and mineral industry. *International Journal of Circular Economy and Waste Management (IJCEWM)* 1(1): 16–32. doi: 10.4018/ijcewm.2021010102
- Kowalski Z, Makara A (2021). The circular economy model used in the polish agro-food consortium: A case study. *Journal of Cleaner Production* 284: 124751. doi: 10.1016/j.jclepro.2020.124751
- Ketels C, Protsiv S (2017). *European Cluster Observatory Report, Priority Sector Report: Circular Economy*. Center for Strategy and Competitiveness Stockholm School of Economics.
- Klein N, Deutz P, Ramos TB (2022). A survey of Circular Economy initiatives in Portuguese central public sector organisations: National outlook for implementation. *Journal of Environmental Management* 314: 114982. doi: 10.1016/j.jenvman.2022.114982
- Kristensen HS, Mosgaard MA (2020). A review of micro level indicators for a circular economy–moving away from the three dimensions of sustainability? *Journal of Cleaner Production* 243: 118531. doi: 10.1016/j.jclepro.2019.118531
- Mehmood A, Ahmed S, Viza E, et al. (2021). Drivers and barriers towards circular economy in agri-food supply chain: A review. *Journal Business Strategy Development* 4(4): 465–481. doi: 10.1002/bsd2.171
- Nuñez-Cacho P, Górecki J, Molina-Moreno V, et al. (2018). What gets measured, gets done: development of a circular economy measurement scale for building industry. *Sustainability* 10(7): 2340. doi: 10.3390/su10072340
- PACE (The Platform for Accelerating the Circular Economy) (2020). *The Circularity Gap Report 2020*. World Economic Forum and World Resources Institute.
- Padash A, Ghatari AR (2020). Toward an innovative green strategic formulation methodology: Empowerment of corporate social, health, safety and environment. *Journal of Cleaner Production* 261: 121075. doi: 10.1016/j.jclepro.2020.121075
- Pesce M, Shi C, Critto A, et al. (2018). SWOT analysis of the application of international standard ISO 14001 in the Chinese context. A case study of Guangdong Province. *Sustainability* 10(9): 3196. doi: 10.3390/su10093196
- Penz E, Polsa P (2018). How do companies reduce their carbon footprint and how do they communicate these measures to stakeholders? *Journal of Cleaner Production JCLP* 195: 1125–1138. doi: 10.1016/j.jclepro.2018.05.263

- Poponi S, Arcese G, Pacchera F, Martucci O (2022). Evaluating the transition to the circular economy in the agri-food sector: Selection of indicators. *Resources, Conservation and Recycling* 176: 105916. doi: 10.1016/j.resconrec.2021.105916
- PWC/PriceWaterhouseCoopers (2015). *Making It Your Business; Engaging with the Sustainable Development Goals*. PriceWaterhouseCoopers/PWC.
- Padilla-Rivera A, Russo-Garrido S, Merveille N (2020). Addressing the social aspects of a circular economy: A systematic literature review. *Journal of Sustainability* 12(19): 7912. Doi: 10.3390/su12197912
- Rótolo GC, Vassillo C, Rodriguez AA, et al. (2022). Perception and awareness of circular economy options within sectors related to agriculture in Argentina. *Journal of Cleaner Production* 373: 133805. doi: 10.1016/j.jclepro.2022.133805
- Sanny L, Simamora BH, Polla JR, Atipa JL (2018). Business strategy selection using SWOT analysis with ANP and fuzzy TOPSIS for improving competitive advantage. *Pertanika Journal of Social Sciences & Humanities* 26(2): 1143–1158.
- Sukhonos V, Makarenko I, Serpeninova Y, Qasimova G (2018). Classification and prioritization of stakeholders' information requests according to sustainable development goals: Case of cross-sector partnership in Ukrainian food production industry. *Journal Problems and Perspectives in Management* 16(4): 126–140. doi: 10.21511/ppm.16(4).2018.12
- Susanto PC (2022). Initiation of a rural edutourism destination in Bali Indonesia based on SWOT analysis. *International Journal of Social Science and Education Research Studies* 2(2): 50–60.
- Teece, D.J. (2017). SWOT Analysis. In *The Palgrave Encyclopedia of Strategic Management*; Palgrave Macmillan: London, UK, 2017; pp. 1–2.
- WBCSD/World Business Council for Sustainable Development (2018). The new big circle, achieving growth and business model innovation through circular economy implementation. Available online: https://www.getabstract.com/en/summary/the-new-big-circle/33546 (accessed on 21 November 2023).
- Wittmayer, J. M., de Geus, T., Pel, B., Avelino, F., Hielscher, S., Hoppe, T., ... & Härtwig, A. (2020). Beyond instrumentalism: Broadening the understanding of social innovation in socio-technical energy systems. *Energy Research & Social Science*, 70, 101689.
- Zhu, B., Nguyen, M., Siri, N. S., & Malik, A. (2022). Towards a transformative model of circular economy for SMEs. *Journal of Business Research*, 144, 545-555.