

THE ROLE OF PLUT IN BRIDGING CIRCULAR ECONOMY POLICIES AND MSME INNOVATION IN INDONESIA

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Abstract

This study aims to analyze the role of the Integrated Business Service Center (PLUT) as an intermediary institution connecting national circular economy policies with innovative practices in the micro, small, and medium enterprises (MSMEs) sector. Using a qualitative case study approach in Tasikmalaya Regency, data collection methods included in-depth interviews, participatory observation, and documentation. The findings show that PLUT has successfully integrated circular economy principles into its MSME support programs through thematic training, creating recycling-based business models, and fostering cross-sector collaboration. The MSMEs responded positively toward sustainable production practices, primarily through simple initiatives like environmentally friendly packaging. Significant challenges include limited capital, a low understanding of concepts, and a lack of market incentives. This study highlights that the success of adopting a circular economy at the micro level depends on the preparedness of business actors and the strength of local institutions capable of translating macro policies into practical, context-specific interventions. These findings contribute to institutional-based circular economy theory development and offer policy recommendations for strengthening the PLUT model as part of a national green economic development strategy.

Keywords: PLUT, MSMEs, circular economy, innovation, sustainability

INTRODUCTION

Indonesia faces increasingly complex pressures to achieve inclusive and sustainable economic growth. Due to climate change, scarcity, and rising waste volumes, the nation must adopt a new economic model focused on resource efficiency. The circular economy, which emphasizes resource reuse and waste reduction through recycling and extending product life cycles, is currently considered a strategic development paradigm (Kirchherr, Reike, & Hekkert, 2017). This approach aims to enhance economic efficiency and reduce systemic environmental pressures.

Through regulations and low-carbon development strategies, the Indonesian government is beginning to incorporate circular economy principles into its national development policies. This effort aligns with global commitments to the Sustainable Development Goals (SDGs), particularly Goal 12, which focuses on responsible consumption and production (Fasa, 2021). However, national policies will not succeed without strong business implementation, particularly regarding micro, small, and medium enterprises (MSMEs), a crucial part of the national economy.

In Indonesia, MSMEs absorb over 96 percent of the workforce and contribute approximately 60.5 percent of the GDP (Kementerian Koordinator Bidang Perekonomian, 2022). This strategic role positions MSMEs as key players in the structural transformation toward an environmentally friendly economy. Conversely, many MSMEs adopt linear business practices that deplete resources and generate high emissions (Rizos et al., 2016). This structured summary captures the critical need for a shift in economic practices among MSMEs to align with sustainable development goals, emphasizing the importance of the circular economy in Indonesia's future.

Therefore, encouraging MSMEs to adopt circular economy principles is a macroeconomic necessity, not just a micro agenda, to maintain the sustainability of national development.

An institution capable of connecting field practices with national policies is needed to support this transformation. The Integrated Business Service Center (PLUT) is the institution intended to carry out that function. PLUT was established by the government to provide non-financial services to MSMEs, such as consulting, training, and market access (Ministry of Cooperatives and SMEs, 2016). PLUT is positioned as a meso-level institutional actor in strengthening the innovation ecosystem and regulating the development of MSMEs with a national sustainable development agenda.

Although it has excellent potential, little empirical research directly studies how PLUT helps MSMEs adopt circular economy innovations. Previous research has focused more on aspects of business promotion, digitalization, or regulation and has not extensively studied the dynamics of policy implementation at the local level (Asiyah et al., 2023; Qurratu'Ain & Dewi, 2020). However, the success of the circular economy does not depend only on technology or the awareness of business actors; cross-sector collaboration and institutional capacity are also important (Cuerva, Triguero-Cano, & Córcoles, 2014; Mulyani, Friani, & Abdullah, 2024). Given this urgency, it is important to study how PLUT performs to encourage SMEs to adopt a circular economy, the institutional strategies used, and the difficulties and opportunities that arise during this process. Furthermore, this research investigates how the PLUT institutional model can help transform the Indonesian economy into a greener and more sustainable one.

This research aims to study the macroeconomic relationship between the role of PLUT and the promotion of SMEs' adoption of circular economy-based innovations in Tasikmalaya Regency. By investigating the institutional mechanisms and cooperation that support sustainability transitions at the grassroots level, this study contributes to the discussion on green economic development, decentralization of policy implementation, and inclusive innovation systems. The research results are expected to serve as a foundation for policy recommendations to enhance local institutions and align MSME development strategies with the national commitment to sustainable growth.

LITERATURE REVIEW

PLUT as a Catalyst for Strengthening MSMEs in the Innovation Ecosystem

The local government institution known as the Integrated Business Service Center (PLUT) aims to enhance the capabilities of MSMEs through non-financial services such as business consulting, training, human resource development, and the provision of market access and business networks (Ministry of Cooperatives and SMEs, 2016). PLUT provides technical training and strategically acts as an agent of change in the local entrepreneurship ecosystem. PLUT serves as a link between entrepreneurs and public policy through a holistic approach. Asiyah et al. (2023) state that PLUT can encourage multiparty collaboration, accelerating MSMEs' access to financing and business training. Fauziah (2021) also found that strengthening the business networks of MSMEs significantly increases their income. Prahsetyo et al. (2018) state that PLUT's ability to adapt creative approaches to the contextual needs of MSME actors is the main factor determining its effectiveness. In addition, PLUT is considered a link between digital transformation, green innovation, and the implementation of local economic policies regarding sustainable development (Organisation for Economic Cooperation and Development [OECD], 2017).

Circular Economy and Adoption Challenges by MSMEs

The circular economy is a sustainable development model that emphasizes resource efficiency by applying the principles of reduce, reuse, and recycle throughout the product life cycle (Kirchherr, Reike, & Hekkert, 2017). This paradigm emerged as a response to the global environmental crisis and an economic transformation strategy to achieve low-carbon growth (Geissdoerfer et al., 2017). However, SMEs still face several structural barriers to adopting a circular economy. Rizos et al. (2016) identified various main constraints, such as limited access to information, environmentally friendly technology, and policy incentives. In the context of Indonesia, Suryantini et al. (2021) show that

knowledge gaps and limited infrastructure also hinder the integration of circular principles into MSME business models. Ormazabal et al. (2018) suggest needs-based training and targeted financial support to encourage the transition from a linear system to a circular model.

Innovation as a Driver of Sustainable-Based MSME Transformation

To maintain the competitiveness of MSMEs, innovation is crucial, especially in the context of the 4.0 industrial revolution and the demands of sustainable development. According to Masood and Sonntag (2020), digital technology enhances efficiency and competitive advantage, but SMEs often face constraints due to limited organizational capacity and resources. Müller (2019) also emphasizes the importance of building adaptive business models that can adjust to external changes, such as regulations and consumer choices regarding environmental issues. PLUT can foster innovation by providing training based on new technologies, building networks of business actors, and assisting in adopting sustainable business models. In this case, a strong green innovation ecosystem is built through cooperation between PLUT, academics, financial institutions, and local governments.

Interconnection between PLUT, Innovation, and Circular Economy

Innovation, the circular economy, and PLUT reinforce each other. PLUT offers technical assistance and is an institution that imparts sustainability values to MSMEs. Qurratu'Ain and Dewi (2020) found that a solid local institutional framework and a practical public communication approach are two important factors in raising entrepreneurs' awareness of sustainability issues. In addition, PLUT can create a cooperative ecosystem supporting the region's structural economic transformation. The role of PLUT as a connector of cross-sector actors in circular innovation for MSMEs is based on the triple helix concept developed by Etzkowitz and Leydesdorff (2000). PLUT is positioned as an institutional hub connecting circular practices at the grassroots level and bridging national economic policies.

RESEARCH METHOD

This research uses a qualitative approach with a case study design to explore the role of PLUT Tasikmalaya Regency in promoting the adoption of circular economy innovations by MSMEs. The qualitative approach aligns with the characteristics of the research problem, which emphasizes the exploration of meaning, processes, and the social dynamics of institutions that cannot be reduced to statistical numbers (Creswell & Poth, 2018). This study uses a purposive sampling approach to select a single case study. This is because the contextual characteristics of PLUT Tasikmalaya indicate that mentoring MSMEs based on green innovation and integrating national circular economy policies is ongoing. When the selected case unit is considered "extremely informative" (extreme/critical case) or has strong conceptual potential to illustrate broader dynamics, a single case study can be scientifically accepted (Yin, 2018; Flyvbjerg, 2006). PLUT Tasikmalaya was chosen because it is one of the few PLUT areas that have explicitly developed SMEs with a circular economy approach. Moreover, this case is relevant as a model that can be applied in other regions due to PLUT's cross-sector support through collaboration with the private sector, ministries, and universities. Therefore, the depth of exploration is more important than broad generalization. This aligns with the principles of qualitative case studies, which emphasize analytical generalization rather than statistical generalization (Stake, 1995; Creswell & Poth, 2018). The research subjects include a PLUT consultant who is also a lecturer at a university and a nurtured MSME actor with over 5 years of business experience who has implemented environmentally friendly practices, purposively selected based on active involvement in the mentoring program.

Data collection was conducted over two weeks in June 2025 using three main techniques: (1) literature study related to policies and concepts of the circular economy; (2) media documentation, including publications of the PLUT program; and (3) in-depth interviews with consultants and MSME actors. Field observations were also carried out to complement the context of the findings.

Data validity is ensured through triangulation of techniques and sources and data confirmation (member check) with informants. Data analysis was conducted thematically through coding and categorization processes to identify patterns of PLUT's role in supporting circular economy practices.

RESULTS AND DISCUSSION

This section discusses the problem formulation related to PLUT's role in promoting the adoption of circular economy innovations in MSMEs, the institutional strategies used, and the challenges and opportunities faced during the process. The findings were obtained through in-depth interviews with PLUT consultants from Tasikmalaya Regency and MSME actors, supported by documentation data, field observations, and thematic analysis based on institutional innovation and circular economy theories.

The Strategic Role of PLUT in Promoting the Circular Economy of MSMEs

The results of the interview with the PLUT consultant show that PLUT Tasikmalaya helps MSMEs level up through integrated facilitation. The PLUT consultant stated:

"The main role of PLUT is as a facilitator and companion for MSMEs to level up through various comprehensive and integrated non-financial services... including institutional enhancement, human resource capacity, market access, and technology utilization."

This effort includes training, business mentoring, enhancement of human resource capabilities, marketing facilities, and improved access to funding and technology. PLUT has begun implementing circular economy principles such as improving production efficiency, using recycled materials, and reducing waste. Baduy black honey producers, supported by SMEs, said they use banana fronds and cardboard as alternative packaging due to the encouragement and guidance from PLUT. The results show that PLUT is an institutional centre or node to bring low-carbon development policies into micro-business practices (Fasa, 2021). Therefore, PLUT offers services to businesses and encourages business behaviour towards a sustainable model.

Integration by PLUT and MSME Response to the Circular Economy

The interview results show that PLUT Tasikmalaya Regency has begun incorporating circular economy principles into its MSME mentoring programs. This is done through thematic training emphasizing resource efficiency, waste reduction, and environmentally friendly materials, such as recycled packaging. According to the PLUT consultant, this action is part of the central government's efforts to support the low-carbon development program.

The supported MSME actors who produce honey demonstrate one form of concrete application. They started wrapping it with banana leaves and used cardboard. According to Kirchherr et al. (2017), simple circular economy practices include production systems that reduce waste and enhance resource utilization efficiency.

In general, SMEs respond positively to this approach, especially entrepreneurs who develop environmental awareness or respond to changing consumer preferences. Some business actors acknowledge that the push to switch to environmentally friendly practices comes from personal awareness and increasing demand for sustainable products.

However, PLUT consultants say that MSMEs understand the circular economy concept differently. Many entrepreneurs see the practice as an additional responsibility rather than a long-term business plan. This result is in line with the research by Rizos et al. (2016), which shows that one of the main constraints for SMEs, including in developed countries, in adopting a circular economy is the limited conceptual understanding.

Strategy and Collaboration PLUT

PLUT also actively collaborates with other institutions such as the government, private companies, universities, and non-governmental organizations. This collaboration includes technical training, managerial mentoring, the development of circular business models, access to capital,

integration of MSME data, and the provision of digital platforms. This cooperation method is similar to the triple helix model (Etzkowitz & Leydesdorff, 2000), which shows that inter-sectoral collaboration enables innovation. PLUT encourages the local innovation ecosystem and enhances MSMEs' access to circular resources by acting as a catalyst and coordinator.

Response and Challenges of MSMEs to the Circular Economy

Although varied, the initial response of MSME actors to the circular economy is quite positive. The main driving factors are increased environmental awareness and market demand for eco-friendly products. However, most MSMEs lack a comprehensive understanding of the circular economy concept. PLUT encounters many challenges. These include limited capital, difficulties obtaining green financing, lack of technical information, and insufficient waste management infrastructure. This is in line with the research by Rizos et al. (2016), which shows that the barriers to CE adoption by SMEs are systemic, particularly in terms of funding, technology, and human resource capabilities.

Contribution to Theory Development

The results of this study theoretically confirm the importance of institutional capacity to support the transition to a circular economy (Cuerva et al., 2014). Unlike previous technological and market readiness theories, this study shows that local institutions such as PLUT can create transitional space, even in areas with limited resources. Therefore, institutional intermediation, cross-sector collaboration, and local ecosystem-based approaches should be incorporated into the circular economy innovation adoption theory. PLUT is a policy implementer and an institutional innovator that bridges the gap between micro-entrepreneurs and national policies.

Contribution to National Theory and Policy

So far, most circular economy theories are rooted in the experiences of developed countries, which emphasize high technological readiness, strong fiscal incentives, and established recycling logistics and infrastructure systems. This research helps strengthen this theory from the perspective of developing countries, particularly in the context of MSMEs. However, field results indicate that this method is ineffective if applied directly in Indonesia, especially for MSMEs facing limitations in capital, access to information, and technological capabilities. These results indicate that local institutional elements, particularly the role of PLUT, serve as an important bridge between macro policies and micro realities. PLUT connects central government programs and encourages changes in business behaviour at the grassroots level. Incorporating the role of institutional intermediation as an important factor in implementing sustainable innovation in the informal and micro sectors expands the theoretical framework of the circular economy. On the policy side, this study emphasizes that institutional decentralization for economic development centered on green principles is very important. PLUT Tasikmalaya shows that implementing a circular economy at the local level requires contextual, flexible, and collaborative facilitators. As a result, national policies must be created to facilitate spaces for local institutional innovation like PLUT; provide flexible and inclusive funding support for circular SMEs; enhance inter-sectoral coordination, or the triple helix, to build a green innovation ecosystem; and standardize indicators of circular economy success that encompass social, economic, and environmental aspects. With this approach, the transformation towards a national green economy can be realized through tangible institutional models, as demonstrated by PLUT in this study.

Empirical Conclusions and Theoretical Contributions

The research results show that PLUT in Tasikmalaya has strategically encouraged SMEs to adopt circular economy practices through an adaptive and collaborative institutional approach. Despite significant obstacles, particularly in financing and technical understanding, the presence of PLUT has successfully created a supportive ecosystem that enables SMEs to transform. From a

theoretical perspective, this research helps expand the framework of circular innovation based on local institutions and emphasizes the crucial role of strengthened institutions for sustainable development. Furthermore, these findings indicate that PLUT can be used as a regional institutional model to drive Indonesia's economic transformation towards a more environmentally friendly and robust direction.

CONCLUSION

This study found that the PLUT of Tasikmalaya Regency plays a strategic role as an institutional facilitator in promoting SMEs' adoption of circular economy innovations. Using an integrated approach that includes training, mentoring, information provision, and multi-stakeholder collaboration, PLUT not only helps improve the technical and managerial capacities of SMEs but also raises awareness of the importance of sustainability in business practices.

Field findings show that MSMEs with direct mentoring and driven by market needs respond well to the circular economy approach. However, basic practices such as eco-friendly packaging and raw material efficiency have not yet been adopted. More responsive public policies are needed to address structural challenges such as capital constraints, technological access, and a lack of incentive support.

In theoretical terms, this research asserts that local institutions such as PLUT play a crucial role in mediating between national policies and changes in practices at the micro-enterprise level. With limited resources, circular innovation can thrive if supported by adaptive and collaborative mentoring strategies, according to the PLUT intermediation model. Therefore, the circular economy theory, primarily focusing on market and technology incentives, must be modified to include social and institutional factors as important components in developing countries.

The PLUT institutional model can be applied in other regions as part of the national green economy development strategy. Therefore, policies must assist through regulation, funding, and strengthening local institutional networks to ensure this transformation can proceed systematically and sustainably. By enhancing the role of PLUT, Indonesia can accelerate the transition towards a more inclusive, competitive, and sustainable economy.

Research shows that PLUT is important in encouraging MSMEs to adopt more sustainable business practices. This research has many practical implications in terms of strengthening the role of PLUT and developing a circular economy at the regional level. Therefore, PLUT must enhance training and mentoring programs incorporating circular economy principles into every coaching aspect. This should include things like production management and environmentally-oriented marketing strategies. In addition to expanding MSMEs' access to green technology and other supporting resources, it is crucial to broaden the networking with financial institutions, the private sector, and educational institutions. From a policy perspective, local governments, the Ministry of Cooperatives, and

SMEs must support MSMEs that implement circular economy practices by providing regulatory and fiscal support. PLUT must also actively participate in discussions on regional policy formulation because they can convey small business actors' real needs and aspirations, especially those related to sustainable development. This research also underscores the importance of MSME actors being more aware and capable of identifying and managing business opportunities based on sustainability principles. This is necessary so that these businesses can survive amidst changing times and contribute to inclusive and environmentally friendly economic development.

This research has several limitations that need to be noted. First, the primary data used is sourced from interviews with one PLUT consultant and one MSME actor, so the scope of the information is still limited to represent the overall dynamics of PLUT in various regions. Second, this research has not conducted direct observations of the circular practices implemented by MSMEs, so the validation of the forms of innovation remains descriptive. Third, the research area is limited to one district, so generalizing the results to other regions must be done cautiously.

Many areas still require improvement in future research, even if this study offers preliminary knowledge of PLUT's impact on encouraging SMEs to implement circular economy technologies. Future studies should include more informants, including PLUT consultants and MSME actors from different industries and geographical areas, to get a complete view. Furthermore, the methods must be broadened. Quantitative and qualitative data should be integrated to ascertain how the adoption of the circular economy has affected the performance of small and medium-sized businesses (SMEs).

Future studies can also focus on long-term studies that evaluate the PLUT mentoring program's effect on medium—and long-term sustainable change. As a result, it is possible to gauge the success of institutional initiatives with more precision. The development of a multiparty partnership model combining local governments, PLUT, corporate actors, and higher education institutions will also be a possible research topic. This will be especially important when developing contextualized and methodical methods to promote the circular economy's wider adoption in the MSME sector.

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