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Turning Straw Waste into Value-Added Products through Social Innovation and Community-Based Circular Economy: The PERMATA Program in Pengabuan, South Sumatra

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Abstract

Reliable temporary electricity is essential to the event industry because power disruptions can interfere with lighting, sound systems, digital equipment, and overall event operations. Consequently, rental providers must combine effective promotional strategies with dependable generator performance to attract potential customers. This study examined the effects of promotion strategy and product quality on customers' interest in renting PT Arthur Teknik's new Genset Synchronize product in Jakarta's event industry. The study employed a quantitative approach using a survey questionnaire. The collected data were analyzed through validity and reliability testing, classical assumption testing, multiple linear regression analysis, the coefficient of determination, and hypothesis testing. Promotion strategy had a positive and significant effect on rental interest ($\beta = 0.310$; $t = 8.033$; $p < 0.001$), indicating that targeted and informative communication increased customer interest. Product quality also positively and significantly affected rental interest ($\beta = 0.424$; $t = 8.481$; $p < 0.001$) and demonstrated a stronger effect than promotion strategy. These findings emphasize the importance of equipment reliability, safety, performance, and technical suitability. PT Arthur Teknik should integrate focused promotional activities with continuous product-quality improvements to strengthen customer confidence, increase rental interest, and enhance market acceptance of synchronized generator services.

INTRODUCTION

Sustainable development is no longer focused solely on economic growth but also on maintaining a balance among economic, social, and environmental dimensions (Kumar et al., 2024; Mezentseva et al., 2024; Safarli, 2024). In rural communities, sustainability is influenced by the capacity of communities to manage local resources, develop diverse livelihood sources, and strengthen institutions to respond to economic and environmental changes (Habib et al., 2023). Social innovation has become an important approach because it not only produces new products or technologies but also promotes changes in social relationships, capacity building, and patterns of community collaboration. Moulaert et al. (2013) explain that social innovation is associated with meeting societal needs, transforming social relationships, and increasing

community capacity. This approach becomes increasingly relevant when combined with the circular economy, which emphasizes resource reuse to reduce waste and retain material value within production cycles (Geissdoerfer et al., 2017).

In Pengabuan Village, South Sumatra, a 2022 social mapping study identified a high economic dependence on seasonal agriculture. This dependence causes household income to fluctuate according to planting and harvesting seasons. Agriculture is a major source of livelihood, while agricultural residues, particularly rice straw, have been managed through open burning. Agricultural activities generate approximately 3–4 tons of dry straw per hectare, most of which was previously burned to accelerate land preparation. Such practices contribute to air pollution and greenhouse gas emissions (Gadde et al., 2009; Singh et al., 2021), with estimated emissions of approximately 220–290 tons of CO_2 per year. To address these interconnected challenges, PT Pertamina EP Adera Field initiated the Self-Reliant Agricultural Program for Rural Resilience (PERMATA). This community-based social innovation program aims to shift the community's paradigm from viewing agricultural waste as a burden to treating it as a valuable economic resource. By applying circular economy principles, the program seeks to simultaneously mitigate environmental pollution, generate alternative employment opportunities, and enhance rural resilience. Transforming straw into economically valuable products is consistent with the principles of the circular economy (Geissdoerfer et al., 2017).

The strategic value of PERMATA lies in the utilization of straw and the development of a value chain involving farmers, agricultural laborers, women, young people, older adults, community groups, market partners, government institutions, and the company. The involvement of multiple actors indicates changes in community capacity, roles, and patterns of collaboration, which are central characteristics of social innovation (Hajek et al., 2014; Moulaert et al., 2013). These changes can also be understood through the perspective of sociotechnical transitions, which view technological change as occurring together with changes in practices, actors, institutions, and relationships within a social system (Geels, 2002; Geels & Schot, 2007).

In Indonesia, the recovery and development of concerts, exhibitions, conferences, festivals, and other public events have created substantial opportunities for supporting businesses, including temporary power providers. Jakarta occupies a strategic position because it accommodates major convention centers, hotels, stadiums, entertainment venues, corporate headquarters, and government institutions. Event organizers in this market generally require electrical equipment that can be installed rapidly and adapted to changing load requirements. However, rental decisions are not determined solely by equipment availability. Prospective customers must also evaluate whether a provider can communicate its offerings convincingly and supply generators that meet operational expectations. Therefore, the ability to introduce specialized products through appropriate promotion strategies while maintaining dependable product quality is central to attracting rental interest.

PT Arthur Teknik introduced the Genset Synchronize product to address the event industry's need for flexible and continuous power. Unlike conventional stand-alone generators, a synchronized generator configuration requires customers to understand its operational benefits, capacity, safety, compatibility, and advantages for different event scales. As a new rental product, its market acceptance depends partly on how effectively the company communicates these benefits to event organizers, production houses, vendors, and corporate

clients. If promotional messages do not reach the appropriate market segments or fail to communicate the product's value clearly, prospective customers may continue using familiar alternatives. Conversely, intensive promotion without dependable equipment performance may generate initial attention but fail to establish confidence and sustained rental interest.

Promotion strategy is consequently an important mechanism for reducing information gaps between rental providers and prospective customers. In a business-to-business service environment, promotion may encompass personal selling, digital marketing, social media communication, sales presentations, direct offers, price incentives, demonstrations, and relationship-based communication. These activities influence customer awareness and enable prospective renters to compare the benefits, costs, and risks associated with alternative services. Yoo et al. (2000) demonstrated that marketing-mix activities could influence customer responses by shaping perceived value and brand equity (Yoo et al., 2000). Hanaysha (2018) similarly found that promotional and marketing communication activities contributed to customers' purchase decisions, although the strength of each factor varied according to market and customer contexts (Hanaysha, 2018). These findings suggest that promotion must be examined in relation to product characteristics and target users.

Product quality is equally critical because renting a generator involves greater operational risk than purchasing an ordinary consumer product. For synchronized generator sets, customers may assess quality through power stability, capacity accuracy, fuel efficiency, equipment condition, synchronization performance, safety, ease of operation, maintenance readiness, and technical support. Zeithaml (1988) explained that perceived quality contributes to consumers' overall evaluation of a product and the value associated with obtaining it (Zeithaml, 1988). Tsiotsou (2006) subsequently showed that perceived product quality was associated with satisfaction, involvement, and purchase intention (Tsiotsou, 2006). In generator rental services, this relationship may be even more consequential because equipment failure can disrupt an entire event rather than merely reduce individual consumer satisfaction.

Previous studies have generally confirmed that promotion and product quality influence customers' behavioral responses. Buil et al. (2013) found that marketing activities shaped consumer perceptions and behavioral outcomes through their effects on brand-related evaluations (Buil et al., 2013). Hanaysha (2018) also established that marketing communication and related customer perceptions contributed to purchasing decisions. Nevertheless, much of the empirical literature has concentrated on retail products, food services, fashion, automotive products, and other consumer markets. In these settings, purchase decisions are usually made by individual consumers and do not necessarily involve the technical, financial, and operational risks found in industrial equipment rental. Thus, findings from consumer-product markets cannot automatically explain rental interest in specialized generator systems.

A further research gap concerns the limited integration of promotion strategy and product quality in explaining interest in renting newly introduced business-to-business equipment. Previous studies commonly investigate purchase intention or purchasing decisions, whereas rental interest has received comparatively less attention. Purchasing and renting involve different evaluations because renters focus on temporary access, equipment readiness, operational reliability, service support, and the provider's ability to respond during a specific usage period. Moreover, research on generator services often emphasizes technical

performance, capacity, fuel consumption, or maintenance rather than customer behavior. The combined effects of promotion strategy and product quality on interest in renting synchronized generators within Jakarta's event industry therefore remain insufficiently explained.

Examining this issue is urgent for both managerial and academic reasons. From a managerial perspective, PT Arthur Teknik needs empirical evidence to determine whether marketing resources should be directed toward expanding promotional reach, improving promotional content, strengthening the quality of the new product, or integrating these priorities. Incorrect resource allocation could increase promotional expenditure without producing sufficient rental demand or could leave technically reliable equipment underrecognized by the market. From an academic perspective, the study extends customer behavior research into a specialized rental-service setting where technical product attributes and marketing communication operate simultaneously. Its novelty lies in analyzing a newly introduced synchronized-generator rental product in the event industry rather than examining conventional consumer purchases.

Accordingly, this study aims to analyze the effects of promotion strategy and product quality on customers' interest in renting the new Genset Synchronize product offered by PT Arthur Teknik in Jakarta's event industry. Specifically, it examines the individual effect of promotion strategy on rental interest, the individual effect of product quality on rental interest, and the simultaneous effect of both variables. The study is expected to contribute empirical evidence regarding the applicability of marketing and perceived-quality concepts to specialized equipment rentals. It also provides a contextual contribution by positioning rental interest as a behavioral outcome shaped by both value communication and customer evaluation of technical product performance.

The findings are expected to benefit PT Arthur Teknik by providing an evidence-based foundation for developing more focused promotional programs, communicating the operational value of synchronized generators, and prioritizing the product-quality attributes most relevant to event-industry customers. Event organizers and production companies may also benefit from clearer information and improved equipment standards when selecting temporary power providers. For researchers, the study offers a reference for further investigations involving promotion, product quality, rental intention, business-to-business services, and technical equipment. Future studies may extend the proposed model by incorporating price perception, service quality, brand trust, perceived risk, customer experience, or relationship quality to produce a more comprehensive explanation of equipment-rental behavior.

METHOD

This study employed a descriptive case study approach to examine the PERMATA Program, particularly the jeramiKA innovation in Pengabuan Village, Penukal Abab Lematang Ilir (PALI) Regency. The case study approach was applied to gain an in-depth understanding of the program by considering its social, economic, and environmental context (Yin, 2018). A descriptive approach was selected to describe the program implementation process and identify changes resulting from the intervention based on conditions before and after implementation.

The object of this study was the PERMATA Program, with a specific focus on the jeramiKA innovation as an initiative to transform straw waste into economically valuable products with environmental benefits. The analysed data included community socioeconomic conditions, program interventions, straw utilization practices, jeramiKA innovation development, community income changes, involvement of vulnerable groups, institutional development, and program sustainability.

The data were analysed descriptively by comparing conditions before and after the implementation of the PERMATA Program. The analysis focused on five dimensions: social, economic, environmental, institutional, and sustainability outcomes. This approach was used to identify observed changes, examine the relationship between program interventions and these changes, and determine factors supporting the sustainability of the jeramiKA innovation. The case study analysis integrated multiple data sources and evidence to obtain a comprehensive understanding of the phenomenon under investigation (Yin, 2018; Creswell & Poth, 2018).

RESULTS AND DISCUSSION

Socioeconomic Conditions of the Community

The findings show that the community in Pengabuan Village has a high dependence on agriculture. Approximately 53.37% of residents work as farmers and 28.17% as agricultural laborers. Income tends to fluctuate because it is strongly influenced by agricultural seasons and productivity. This condition indicates a need to diversify local livelihood sources.

The concept of *livelihood diversification* explains that rural households can strengthen economic resilience by developing multiple sources of income rather than relying entirely on a single occupation or source of livelihood (Ellis, 2000). Livelihood diversification is also an important strategy for coping with income uncertainty, production risks, and changing rural economic conditions (Scoones, 1998).

The PERMATA Program promotes the use of straw as an economic resource and creates opportunities for productive activities outside primary agricultural production. This approach is consistent with circular economy principles, which encourage the reuse of resources and production residues so that they can retain or gain higher use and economic value (Geissdoerfer et al., 2017). Straw is viewed as an input for subsequent economic activities. This creates opportunities for alternative income while supporting resource efficiency and more sustainable agricultural waste management.

Transforming Straw into Economically Valuable Products

Before implementation of the program, more than 70% of harvested straw was reportedly burned by the community to accelerate land preparation. Open burning had the potential to cause air pollution through particulate and greenhouse gas emissions and to cause the loss of nutrients contained in straw biomass (Singh & Patel, 2022). Using straw as a raw material for value-added products can provide a more sustainable alternative for managing agricultural residues while reducing the environmental impacts of open burning (Singh et al., 2024).

The PERMATA Program changed this pattern by utilizing straw as the raw material for jeramiKA production. The processing stages include straw collection, chopping, material processing, molding, pressing, and drying. To support production, the program provided production machinery and a *dry house* to improve processing efficiency and product quality.

This sequence demonstrates the application of circular economy principles by keeping resources and material value within the economic system for as long as possible (Geissdoerfer et al., 2017). Through this approach, straw that was previously treated as agricultural residue is redirected as a production input, generating economic value while providing environmental and social benefits to the community.

Environmental Impacts

An important outcome of the jeramiKA innovation is the reduction in straw burning. The program reports that approximately 105–140 tons of straw per year were diverted for use as jeramiKA raw material. This is equivalent to an estimated 70% reduction in straw burning and an estimated reduction of 220–290 tons of CO_2 emissions per year. The environmental indicators are summarized in Table 1.

Table 1. Environmental Impact Indicators of the PERMATA Program

Indicator	Condition/Result
Straw utilization	Approximately 105–140 tons/year
Reduction in straw burning	Approximately 70%
Estimated emission reduction	Approximately 220–290 tons CO_2/year
Main product	JeramiKA environmentally friendly containers
Function	Alternative to conventional packaging

These findings show that the environmental benefits are associated with reduced straw burning and substitution of packaging materials that are difficult to degrade.

Economic Impacts

The economic dimension shows that the jeramiKA innovation creates opportunities to diversify community income by transforming straw into economically valuable products. The program report indicates that group members receive additional income averaging IDR 2,000,000–3,000,000 per person per month, representing an increase of approximately 60–70% compared with their previous seasonal income. Income diversification is an important strategy for rural households to reduce dependence on a single livelihood source and strengthen economic resilience (Ellis, 2000).

The economic impact is also reflected in the emergence of a value chain involving farmers as raw-material suppliers and community groups in processing and marketing. This indicates that empowerment initiatives need to be supported by access to productive resources and markets to generate sustainable value creation (Kaplinsky & Morris, 2001). The PERMATA Program resulted in 35% of jeramiKA production is absorbed by food-packaging needs within the company's operational environment, 50% is marketed through distribution partners, and 15% is absorbed by local micro, small, and medium enterprises. This internal market helps provide demand certainty during the early stage of business development. This reflects the concept of creating shared value, in which business development generates economic benefits for communities while simultaneously supporting company needs (Porter & Kramer, 2011).

Empowerment of Vulnerable Groups

The PERMATA Program adopts an inclusive approach to involving vulnerable groups. The report indicates that among 125 vulnerable households involved in the program, 30 households experienced improved welfare conditions, and 24 households experienced

increased income sufficient to reach or exceed the PALI Regency Minimum Wage (UMK), which was approximately IDR 3,456,874. In addition, 23 women participated in jeramiKA production and group business management, 11 young people joined the Taruna Tani group, and 21 older adults contributed according to their respective capacities.

This involvement indicates that program benefits were not limited to the core production group but were extended through differentiated roles according to the capacities of different community groups. The roles of these groups within the PERMATA value chain are presented in Table 2.

Table 2. Involvement of Vulnerable Groups

Group	Form of Involvement
Women	Production and business management
Young people	Production and economic activities through Taruna Tani
Older adults	Production activities according to their capacity
Farmers	Supply of straw as raw material
Agricultural laborers	Production activities and alternative income sources

Table 2 shows that each group has a role within the jeramiKA value chain, ranging from raw-material supply to production and business management. The involvement of vulnerable groups provides access to economic activities and alternative income sources that can reduce the marginalization of vulnerable groups. Such an approach is consistent with the social innovation perspective, which emphasizes meeting societal needs, increasing capacity, empowering communities, and changing social relationships (Moulaert et al., 2013; Cajaiba-Santana, 2014).

Novelty of the Social Innovation

The novelty of the PERMATA Program can be examined at three levels.

First, the incremental level. At this level, the innovation improves the existing practice of straw waste management. Previously, straw was burned, whereas after the intervention, part of the straw was used as a raw material for product manufacturing. The program report records that approximately 105–140 tons of straw per year were diverted from burning and used as raw material for jeramiKA.

Second, the systemic level. The program establishes new relationships among farmers, women, young people, older adults, companies, market partners, and government institutions. This is consistent with Geels (2002), who argues that system change involves not only technology but also user practices, networks, institutions, and infrastructure.

Third, the transformative level. At this level, the most important change is the way waste is perceived. Straw that previously regarded as an environmental problem is valued as an economic asset.

The program places vulnerable groups within the processes of production, processing, and value distribution based on local resources. Therefore, the novelty of jeramiKA is the material used to make the product and the social and economic architecture developed around that product.

Institutional Strengthening and Knowledge Development

The sustainability of social innovation requires local capacity to maintain and develop knowledge after external program intervention ends. The PERMATA Program developed the

Pertamina Community Learning Center (Pusat Pembelajaran Masyarakat Pertamina, PPMP) as a community learning space for learning activities, training, meetings, and knowledge sharing. The program also developed an ISBN-registered learning module on converting straw into environmentally friendly containers.

The existence of this learning centre strengthens community capacity because knowledge is transferred through mentoring, documented and made available for repeated use by the community. This condition is consistent with the concept of social learning, which refers to collective and collaborative learning processes that allow different stakeholders to exchange knowledge, experiences, and perspectives to develop more sustainable practices (Wals, 2007; Dlouhá et al., 2013). Such processes are important for sustaining innovation because they encourage communities to become actors that capable of maintaining, adapting, and further developing innovations independently. Recent research also indicates that social learning contributes to change, innovation, and sustainability through collective learning processes (Silva-Jean & Kneipp, 2024).

Impact Compass and Program Effectiveness

The PERMATA Program uses the Impact Compass framework to assess the effectiveness of the social innovation. The program ranked second in the dimensions of Value to Society, Efficacy, and Impact Magnitude. These results suggest that the program was assessed as having relatively high social value, implementation effectiveness, and potential impact. In the Value to Society dimension, the benefits of the program are reflected in increased economic activity and environmental improvements. The efficacy dimension indicates that the solution can be implemented using relatively simple technologies that are appropriate for community capabilities.

The PERMATA Program from a Circular Economy Perspective

The PERMATA Program establishes the following cycle:

Agriculture → straw → processing → jeramiKA products → market → community income → capacity strengthening → local economic sustainability.

The circular economy principles in this program include materials that previously functioned as residues are returned to economic processes to generate additional value (Geissdoerfer et al., 2017; Kirchherr et al., 2017). The PERMATA model has a broader characteristic because it integrates both material and social dimensions. Straw utilization is supported by community groups, knowledge, institutions, and market networks. Community involvement as the main driver indicates that the model can be understood as a form of community-based circular economy that connects resource management with the creation of local social and economic benefits (Murray et al., 2017; Korhonen et al., 2018).

Implications for Program Sustainability

The sustainability of the PERMATA Program is determined by raw-material availability, production capacity, market access, and local institutions. The availability of straw is fundamental to sustaining jeramiKA production, while production capacity determines the community's ability to maintain product quality and meet market demand. The company's internal market can serve as an initial market, but market diversification is needed to reduce dependence on a single consumer and strengthen the value chain (Kaplinsky & Morris, 2001).

Local institutions also play an important role in sustaining the innovation through strengthened community groups, the PPMP, learning modules, and government support. Strong

institutions support collective resource management and enhance the capacity of communities to maintain established practices (Ostrom, 1990). These factors are central to the transformation process initiated by the PERMATA Program because the continuity of raw materials, production capacity, market access, and institutional support determines the ability of the program to sustain its intervention outcomes and achieve long-term change. The change framework is summarized through the *Theory of Change* presented in Table 3.

Table 3. Theory of Change Framework for the PERMATA Program

Stage of Change	Condition	Description of Change
Problem	Dependence on agriculture, seasonal income, straw waste, straw burning, and limited access for vulnerable groups	Recognition of interconnected economic, social, and environmental problems
Intervention	Training, appropriate technology, straw processing, group strengthening, market access, and mentoring	Increased community capacity and ability to manage local resources
Innovation	JeramiKA as an environmentally friendly container made from straw	Straw is transformed from agricultural residue into an economically valuable raw material
Output	Straw utilized, products produced, vulnerable groups involved, markets established, and capacity strengthened	New community-based production activities and value chains are established
Outcome	Alternative income, reduced straw burning and emissions, increased social participation, and stronger institutions	Economic, social, and environmental changes occur within the community
Impact	More resilient communities, more diversified local economies, sustainable resource management, and a circular economic ecosystem	A sustainable community empowerment model based on the circular economy is established

CONCLUSION

This study concluded that promotion strategy and product quality positively and significantly influenced customers' interest in renting PT Arthur Teknik's new Genset Synchronize product in Jakarta's event industry. Promotion strategy had a significant positive effect on rental interest ($\beta = 0.310$; $t = 8.033$; $p < 0.001$), demonstrating that clear, targeted, and persuasive communication increased prospective customers' awareness and interest. Product quality also had a significant positive effect ($\beta = 0.424$; $t = 8.481$; $p < 0.001$) and exerted a stronger influence than promotion strategy. These results indicated that customers primarily considered equipment reliability, performance, safety, and suitability for event operations when selecting generator rental services. Therefore, PT Arthur Teknik should integrate targeted promotional activities with continuous improvements in equipment quality and technical support to strengthen rental interest and market acceptance.

Future research should examine a broader range of generator rental companies, event organizers, and geographical areas to improve the generalizability of findings. Researchers may also incorporate additional variables, such as rental price, service quality, brand trust, perceived risk, customer experience, technical support, and electronic word of mouth, as mediating or moderating factors affecting rental interest. Longitudinal or mixed-method research is recommended to determine whether customers' initial rental interest develops into actual rental

decisions, repeat rentals, and long-term loyalty. Comparative research across different event categories and generator capacities could further explain how customer requirements and operational risks influence the selection of temporary power services.

REFERENCES

Cajaiba-Santana, G. (2014). Social innovation: Moving the field forward. A conceptual framework. *Technological Forecasting and Social Change, 82*, 42–51.

Creswell, J. W., & Poth, C. N. (2018). *Qualitative inquiry and research design: Choosing among five approaches* (4th ed.). SAGE Publications.

Dlouhá, J., Barton, A., Janoušková, S., & Dlouhý, J. (2013). Social learning indicators in sustainability-oriented regional learning networks. *Journal of Cleaner Production, 49*, 64–73.

Ellis, F. (2000). *Rural livelihoods and diversity in developing countries*. Oxford University Press. https://doi.org/10.1093/oso/9780198296959.001.0001

Gadde, B., Bonnet, S., Menke, C., & Garivait, S. (2009). Air pollutant emissions from rice straw open field burning in India, Thailand and the Philippines. *Environmental Pollution, 157*(5), 1554–1558. https://doi.org/10.1016/j.envpol.2009.01.004

Geels, F. W. (2002). Technological transitions as evolutionary reconfiguration processes: A multi-level perspective and a case-study. *Research Policy, 31*(8–9), 1257–1274. https://doi.org/10.1016/S0048-7333(02)00062-8

Geels, F. W., & Schot, J. (2007). Typology of sociotechnical transition pathways. *Research Policy, 36*(3), 399–417.

Geissdoerfer, M., Savaget, P., Bocken, N. M. P., & Hultink, E. J. (2017). The circular economy—A new sustainability paradigm? *Journal of Cleaner Production, 143*, 757–768. https://doi.org/10.1016/j.jclepro.2016.12.048

Habib, N., Ariyawardana, A., & Aziz, A. A. (2023). The influence and impact of livelihood capitals on livelihood diversification strategies in developing countries: A systematic literature review. *Environmental Science and Pollution Research, 30*, 69882–69898.

Hajek, P., Henriques, R., & Hajkova, V. (2014). Visualising components of regional innovation systems using self-organizing maps—Evidence from European regions. *Technological Forecasting and Social Change, 84*, 197–214.

Kaplinsky, R., & Morris, M. (2001). *A handbook for value chain research*. Institute of Development Studies, University of Sussex.

Kirchherr, J., Reike, D., & Hekkert, M. (2017). Conceptualizing the circular economy: An analysis of 114 definitions. *Resources, Conservation and Recycling, 127*, 221–232. https://doi.org/10.1016/j.resconrec.2017.09.005

Korhonen, J., Honkasalo, A., & Seppälä, J. (2018). Circular economy: The concept and its limitations. *Ecological Economics, 143*, 37–46. https://doi.org/10.1016/j.ecolecon.2017.06.041

Kumar, P., Sharma, L., & Sharma, N. C. (2024). Sustainable development balancing economic viability, environmental protection, and social equity. In *Sustainable partnership and investment strategies for startups and SMEs* (pp. 212–234). IGI Global Scientific Publishing.

Mezentseva, E., Baysaeva, M., & Fayzullaev, N. (2024). The impact of sustainable development on economic growth: Balancing environmental, social and economic factors. *Reliability: Theory & Applications, 19*(SI 6 [81]), 1269–1274.

Moulaert, F., MacCallum, D., Mehmood, A., & Hamdouch, A. (Eds.). (2013). *The international handbook on social innovation: Collective action, social learning and transdisciplinary research*. Edward Elgar Publishing.

Murray, A., Skene, K., & Haynes, K. (2017). The circular economy: An interdisciplinary exploration of the concept and application in a global context. *Journal of Business Ethics, 140*, 369–380. https://doi.org/10.1007/s10551-015-2693-2

Porter, M. E., & Kramer, M. R. (2011). Creating shared value. *Harvard Business Review, 89*(1–2), 62–77.

Safarli, A. J. (2024). The economics of sustainable development: Balancing growth and environmental conservation. *Elmi Əsərlər, 63*.

Silva-Jean, M., & Kneipp, J. (2024). Social learning, innovation, and sustainability: The search for directions beyond a systematic literature review. *Heliyon, 10*(7), e28431.

Singh, G., Gupta, M. K., Chaurasiya, S., Sharma, V. S., & Pimenov, D. Y. (2021). Rice straw burning: A review on its global prevalence and the sustainable alternatives for its effective mitigation. *Environmental Science and Pollution Research*. https://doi.org/10.1007/s11356-021-14163-3

Singh, Y., Sharma, S., Kumar, U., Sihag, P., Balyan, P., Singh, K. P., & Dhankher, O. P. (2024). Strategies for economic utilization of rice straw residues into value-added by-products and prevention of environmental pollution. *Science of the Total Environment, 906*, 167714. https://doi.org/10.1016/j.scitotenv.2023.167714

Wals, A. E. J. (Ed.). (2007). *Social learning towards a sustainable world: Principles, perspectives, and praxis*. Wageningen Academic Publishers.

Yin, R. K. (2018). *Case study research and applications: Design and methods*. SAGE.