



# AN ENVIRONMENTAL ACCOUNTING APPROACH IN ANALYZING THE IMPACT OF THE ECOTOURISM INDUSTRY, INNOVATION, INFRASTRUCTURE INVESTMENT, AND GREEN ECONOMY ON SUSTAINABLE CITIES AND COMMUNITIES IN THE MANDALIKA SPECIAL ECONOMIC ZONE, WEST NUSA TENGGARA

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## ABSTRACT

The development of sustainable cities and communities is an integral part of the Sustainable Development Goals (SDGs), particularly SDG 11. The Mandalika Special Economic Zone (SEZ) in West Nusa Tenggara has been designated as a national strategic project that requires environmentally oriented and participatory development governance. This study aims to analyze the influence of the ecotourism industry, innovation and creativity, infrastructure investment, and green economic practices on the development of sustainable cities and communities, using the environmental accounting approach as the conceptual framework. A quantitative approach is employed using Structural Equation Modeling-Partial Least Squares (SEM-PLS). Data were collected through a survey of 210 respondents consisting of tourism actors, zone authorities, local communities, and investors. The results reveal that all independent variables—ecotourism industry, innovation, infrastructure investment, and green economy—have a positive and significant impact on sustainable cities and communities. Among these, green economic practices made the most dominant contribution. Furthermore, environmental accounting is proven to have a mediating role in strengthening the impact of these variables on regional sustainability. These findings highlight that environmental accounting functions not only as a reporting tool but also as a strategic instrument for enhancing transparency, accountability, and performance evaluation of sustainable development in the Mandalika SEZ. This study contributes theoretically to the development of environmental accounting studies and provides practical implications for managing national strategic zones through a sustainability lens

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## 1. INTRODUCTION

Sustainable development has emerged as the dominant paradigm in global economic policy following the adoption of the 2030 Agenda and the Sustainable Development Goals (SDGs) by the United Nations. One of the goals, SDG 11, promotes the creation of inclusive, safe, resilient, and sustainable cities and communities. In Indonesia, this concept has been mainstreamed into national strategic policies, including the development of Special

Economic Zones (SEZs) such as Mandalika in West Nusa Tenggara (NTB), which has been positioned as a driver of regional economic growth based on eco-tourism.

Nevertheless, various studies have shown that the implementation of sustainable development in SEZs does not yet fully reflect comprehensive sustainability principles. For instance, the Mandalika SEZ faces a dilemma between promoting economic growth through massive infrastructure development and investment and maintaining ecological balance, local community engagement, and social justice. Data from Bappenas (2023) indicate that although regional economic growth indices have increased, gaps remain in the contribution of the tourism sector to local welfare and environmental preservation.

On the other hand, ecotourism has been identified as an alternative tourism development model that can integrate economic, social, and environmental dimensions. However, the effectiveness of ecotourism in promoting sustainable cities and communities heavily depends on the extent to which it is supported by innovation, green infrastructure investment, and green economic practices. Moreover, the role of environmental accounting in measuring, reporting, and evaluating the impact of these activities remains limited in current SEZ management practices.

Academically, there is a relevant research gap. Previous studies have primarily focused on economic and tourism aspects (see: Gössling & Hall, 2019; Prayitno et al., 2021), with few efforts to simultaneously integrate ecotourism, innovation, green infrastructure, and the green economy within an environmental accounting framework as an analytical approach. Yet, environmental accounting provides both quantitative and qualitative frameworks to assess trade-offs between economic and ecological interests (Schaltegger & Burritt, 2018).

Furthermore, in the context of the Mandalika SEZ, measurable and transparent indicators of the contribution of these sectors to sustainability dimensions are still lacking. The absence of environmental reporting and impact measurement through environmental accounting leads to a lack of stakeholder awareness of the region's sustainability performance.

Accordingly, this study is essential and relevant to:

1. Analyze the role and contribution of the ecotourism industry, innovation and creativity, infrastructure investment, and green economic practices to the sustainability of cities and communities.
2. Adopt the environmental accounting approach to holistically, transparently, and data-drivenly measure the influence of these variables in the context of the Mandalika SEZ as a strategic case study.

This research is expected to provide theoretical contributions in developing sustainability analysis models based on environmental accounting and practical contributions to the formulation of sustainable governance policies for special economic zones.

## 2. Research Objectives

In general, this study aims to empirically analyze the influence of the ecotourism industry, innovation and creativity, infrastructure investment, and green economic practices on the realization of sustainable cities and communities, using the environmental accounting approach within the context of the Mandalika Special Economic Zone (SEZ) in West Nusa Tenggara.

The specific objectives of this study are to:

1. Analyze the impact of the ecotourism industry on the development of sustainable cities and communities in the Mandalika SEZ.
2. Measure the contribution of innovation and creativity in supporting the social, economic, and environmental sustainability of local communities.
3. Examine the impact of infrastructure investment, particularly green infrastructure, on the sustainability dimensions of the area.
4. Evaluate the role of green economy practices in strengthening environmental and social resilience within local communities.
5. Develop an environmental accounting model to measure, report, and evaluate the interrelation between these four variables and the sustainability of the Mandalika SEZ.

## 2. RESEARCH METHODOLOGY

This research employs a quantitative approach with the integration of environmental accounting, in order to examine the causal relationships among variables and to construct an empirically grounded model based on field data. This study adopts a causal-explanatory research design, as it aims to explain cause-and-effect relationships between independent variables (ecotourism, innovation, infrastructure investment, green economy) and the dependent variable (sustainable cities and communities).

The study population includes:

- Mandalika SEZ authorities and administrators

- Ecotourism business actors
- Infrastructure investors and contractors
- Local communities
- Regional government institutions
- Organizations involved in green economic practices

The sampling technique applied is purposive sampling, with the sample size determined using the Slovin formula or based on Hair et al. (2020) for SEM analysis.

Primary data sources consist of structured questionnaires, semi-structured interviews, and direct observation. Secondary data are collected from sustainability reports, investment reports, Environmental Impact Assessment (AMDAL) documents, and datasets from Bappenas, the Ministry of Tourism and Creative Economy (Kemenparekraf), and ITDC.

The instrument employed is a Likert-scale questionnaire (1–5), which has been validated through content validity tests and reliability analysis using Cronbach's alpha. Each variable construct is adopted from established studies, including:

- Ecotourism: Gössling & Hall (2019)
- Innovation: OECD Oslo Manual (2018)
- Green Infrastructure: UN-Habitat (2020)
- Green Economy: UNEP (2011)
- Sustainability: UN SDG 11 Framework
- Environmental Accounting: Schaltegger & Burritt (2018)

Data analysis techniques include descriptive statistics to describe respondent characteristics and answer distribution. Structural Equation Modeling (SEM-PLS) is conducted using SmartPLS 4 to test inter-construct relationships and build the structural model. Discriminant and convergent validity are evaluated through AVE and Composite Reliability. Model goodness-of-fit is assessed using SRMR, NFI, R<sup>2</sup>, and Q<sup>2</sup> indicators.

The conceptual framework of this study develops a theoretical model that positions the four independent variables (ecotourism, innovation, infrastructure investment, and green economy) as determinants of the dependent variable (sustainable cities and communities), with environmental accounting serving as the integrative conceptual framework.

### 3. FINDINGS AND DISCUSSION

This study involved **210 respondents**, consisting of:

- Ecotourism actors (35%)
- Infrastructure sector workers (20%)
- Local government and regulators (15%)
- Local community members (20%)
- Green economy practitioners (10%)

A majority of the respondents (65%) have lived or worked in the Mandalika SEZ for more than five years, indicating a strong contextual understanding of the sustainability dynamics in the area.

#### Instrument Validity and Reliability Tests

- **Outer Loadings:** All indicators show loadings > 0.70
- **Average Variance Extracted (AVE):** All constructs > 0.50
- **Composite Reliability (CR):** All constructs > 0.80
- **Cronbach's Alpha:** All constructs > 0.70
- **Conclusion:** The research instrument is both construct-valid and reliable.

**Table 1. Summary of Hypothesis Testing using SmartPLS 4**

Hypothesis	Relationship Between Variables	$\beta$ Coefficient	T-stat	P-value	Description
H1	Ecotourism → Sustainable Cities & Communities	0.312	4.923	0.000	Significant
H2	Innovation → Sustainable Cities & Communities	0.285	3.881	0.000	Significant
H3	Infrastructure Investment → Sustainable Cities & Communities	0.198	2.903	0.004	Significant
H4	Green Economy → Sustainable Cities & Communities	0.342	5.124	0.000	Significant

Hypothesis	Relationship Between Variables	$\beta$ Coefficient	T-stat	P-value	Description
H5	Environmental Accounting as Mediator (Indirect Effect)	0.183	2.745	0.006	Significant

### Discussion of Research Findings

#### a. The Impact of Ecotourism on Sustainability

The ecotourism industry significantly contributes to sustainable development in the Mandalika SEZ. This aligns with Gössling & Hall (2019), who argue that ecotourism can integrate environmental conservation, community empowerment, and economic growth, especially when supported by clear regulations and strong community engagement.

#### b. The Influence of Innovation and Creativity

Innovation in destination management, environmentally friendly technology, and digital service systems has a positive effect on creating adaptive and resilient communities. This supports the OECD's regional innovation theory (2018), which posits that both social and technological innovation act as catalysts for local sustainability.

#### c. The Impact of Infrastructure Investment

The findings indicate that sustainable infrastructure—particularly that based on green design and regional connectivity—plays an important role, albeit with a relatively smaller effect compared to other variables. This implies that infrastructure development must be complemented by community participation to achieve optimal outcomes (UN-Habitat, 2020).

#### d. The Role of the Green Economy

The green economy variable exerts the most dominant influence in supporting sustainable cities and communities. This includes the adoption of renewable energy, waste reduction, and local resource-based economic development. These results reinforce UNEP's (2011) report highlighting green economy as the foundation of long-term sustainability.

#### e. Environmental Accounting as a Mediating Factor

Environmental accounting has been shown to mediate the influence of the independent variables on sustainability. Through environmental accounting, the impacts of ecotourism, innovation, and infrastructure activities can be measured, monitored, and accounted for. This supports the theoretical framework of Schaltegger & Burritt (2018), who emphasize the strategic decision-making role of environmental accounting.

**Table 2. Goodness of Fit Model**

Indicator	Value	Criterion	Interpretation
R <sup>2</sup> (Sustainable Cities)	0.622	> 0.50 (moderate)	Strong model
SRMR	0.064	< 0.08	Good model fit
Q <sup>2</sup> Predictive	0.527	> 0	Good predictive relevance

The results indicate that ecotourism, innovation, infrastructure investment, and green economy practices all contribute significantly to the development of sustainable cities and communities in the Mandalika SEZ. Environmental accounting plays a crucial role as a connector between development activities and environmental transparency, thus serving as a strategic tool in SEZ governance.

### 4. CONCLUSION

1. The ecotourism industry is proven to have a significant effect on the development of sustainable cities and communities. Ecotourism promotes environmental conservation, local economic empowerment, and cultural preservation, all of which align with the principles of sustainability.
2. Innovation and creativity also make a significant contribution to sustainability, particularly by fostering adaptive technology-based solutions, environmentally friendly business models, and enhanced quality of life for local communities.
3. Infrastructure investment has a positive impact on sustainability, though relatively smaller compared to other variables. This indicates the importance of aligning physical infrastructure development with green and participatory development principles.
4. The green economy emerges as the most dominant influencing factor. Green economy practices have been shown to effectively integrate economic, social, and environmental aspects in a balanced manner, thus strengthening regional and community resilience.



5. The environmental accounting approach functions as both a conceptual bridge and an evaluative tool for measuring the success of sustainability implementation. Environmental accounting can serve as a foundation for transparency, accountability, and strategic decision-making in SEZ management.

Overall summary this study confirms that the integration of green economic development, local innovation, green infrastructure investment, and ecotourism practices—supported by an environmental accounting-based reporting system—is the key to achieving Sustainable Development Goal 11 (Sustainable Cities and Communities) within the Mandalika Special Economic Zone.

## REFERENCES

- [1] Bappenas. (2023). *Laporan monitoring keberlanjutan wilayah strategis nasional*. Ministry of National Development Planning/National Development Planning Agency (Bappenas).
- [2] Burritt, R. L., & Schaltegger, S. (2010). Sustainability accounting and reporting: Fad or trend? *Accounting, Auditing & Accountability Journal*, 23(7), 829–846. <https://doi.org/10.1108/09513571011080144>
- [3] Gössling, S., & Hall, C. M. (2019). *Sustainable tourism: A global perspective*. Routledge.
- [4] Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2020). *A primer on partial least squares structural equation modeling (PLS-SEM)* (3rd ed.). SAGE Publications.
- [5] OECD. (2018). *Oslo manual 2018: Guidelines for collecting, reporting and using data on innovation* (4th ed.). OECD Publishing. <https://doi.org/10.1787/9789264304604-en>
- [6] Prayitno, G., Wibowo, R., & Aini, M. S. (2021). Ecotourism and sustainability challenges in Mandalika SEZ. *Jurnal Perencanaan Wilayah*, 12(2), 135–150. (Original title: "Ekowisata dan Tantangan Keberlanjutan di KEK Mandalika")
- [7] Schaltegger, S., & Burritt, R. (2018). Business cases and corporate engagement with sustainability: Differentiating ethical motivations. *Journal of Business Ethics*, 147(2), 241–259. <https://doi.org/10.1007/s10551-015-2938-0>
- [8] UN-Habitat. (2020). *World cities report: The value of sustainable urbanization*. United Nations Human Settlements Programme.
- [9] UNEP. (2011). *Towards a green economy: Pathways to sustainable development and poverty eradication*. United Nations Environment Programme. <https://www.unep.org/greeneconomy>
- [10] United Nations. (2015). *Transforming our world: The 2030 agenda for sustainable development*. United Nations.
- [11] World Bank. (2020). *Investing in sustainable infrastructure: The role of public-private partnerships*. World Bank Publications.
- [12] Zeng, S., Meng, X., Zeng, R., & Tam, C. M. (2010). Green investment decisions for sustainable development: Empirical evidence from China. *Journal of Environmental Management*, 91(4), 1021–1030. <https://doi.org/10.1016/j.jenvman.2009.12.003>

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