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Deconstructing sustainability accounting practices in micro-scale enterprises: a case study of a fish-cilok (a traditional fish-based tapioca snack) production center in kangean island

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ABSTRACT

This study aims to examine the applicability of sustainability accounting to the informal sector and explore how practical accountability and local wisdom contribute to income generation and business resilience, focusing on the fish-cilok (a traditional savory fish-tapioca snack) production industry on Kangean Island, Indonesia The primary aim of this study is to investigate how practical accountability and local wisdom are embedded in everyday business practices and how these practices contribute to income generation and business resilience. Employing a qualitative exploratory approach with a case study design, data were collected through interviews, observations, and document analysis. The findings indicate that sustainability practices are already embedded in the daily operations of micro-enterprises, although they are not explicitly recognized as sustainability accounting. These practices can be interpreted through the three pillars of the Triple Bottom Line (TBL). First, the profit dimension is manifested through value-added efficiency, particularly the utilization of low-value fish (*ikan rucah*) as a production input, which contributes to improved production efficiency and profit margins. Second, the people dimension is reflected in *gotong royong*, local labor participation, and community-based production networks that support workforce stability and reduce transaction and labor-related costs. Third, the planet dimension is demonstrated through circular management of production by-products, whereby residual materials are reused or transformed into economically valuable resources. The study demonstrates that simplifying sustainability accounting and embedding it within existing local practices can reposition sustainability from an additional administrative burden into a practical mechanism for resource efficiency, community empowerment, and business resilience.

Keywords: blue economy, kangean island, micro-scale enterprises, practical accountability, sustainability accounting, triple bottom line

INTRODUCTION

Micro-scale enterprises play an important role in sustaining local economic activity, particularly in resource-dependent and geographically remote communities (Kraus et al., 2020). In coastal and

archipelagic regions, micro-enterprises frequently rely on locally available natural resources while simultaneously facing constraints in financial management, digitalization, market access, and formal reporting capacity (Rahman et al., 2021). These conditions create a particular challenge for sustainability accounting because conventional sustainability reporting approaches tend to assume the availability of structured information systems, accounting expertise, and organizational resources that may not exist in micro-scale enterprises (Larrinaga & Garcia-Torea, 2022). Consequently, sustainability accounting needs to be understood not only as a formal reporting mechanism but also as a practical process through which small businesses manage economic, social, and environmental resources (Bebbington & Unerman, 2018).

This issue is particularly relevant to Kangean Island, Indonesia, where marine resources provide an important foundation for community-based economic activities (Purwanto et al., 2021). Among these activities is the production of fish-cilok, a locally processed fish product that utilizes marine resources and involves small-scale producers and local labor. Despite its economic potential, micro-scale food processing enterprises in remote island communities commonly operate with limited formal accounting and documentation practices (Azis et al., 2022). Business decisions are often based on experience, direct observation, cash transactions, and community-based relationships rather than standardized accounting systems (Widodo et al., 2023). Such conditions raise an important question: can sustainability accounting remain meaningful when it is simplified and embedded within the everyday practices of micro-enterprises?

The dominant approaches to sustainability accounting and reporting provide useful principles for integrating economic, environmental, and social dimensions into organizational decision-making (Adams, 2017).. However, their application to micro-scale enterprises may create practical challenges when reporting requirements are perceived as complex, resource-intensive, or disconnected from everyday business activities (Mio et al., 2020). Rather than assuming that micro-enterprises should replicate reporting practices developed for larger organizations, a more contextual approach is needed to identify the underlying sustainability practices that already exist within informal economic activities (Schaltegger et al., 2022). From this perspective, sustainability accounting can be reconstructed as a practical mechanism for identifying resource efficiency, social contribution, environmental responsibility, and economic value creation without imposing unnecessary administrative complexity.

Recent research on sustainability and small-business development has increasingly emphasized the importance of resource efficiency, environmental practices, social capital, and organizational resilience (Megahed et al., 2022). Nevertheless, important gaps remain. First, much of the existing literature examines sustainability accounting and reporting in relatively formal organizational environments, while less attention has been given to informal micro-enterprises (Cantele & Zardini, 2018). Second, empirical research remains concentrated in urban and economically developed settings, leaving remote island communities comparatively underexplored (Hossain et al., 2021). Third, sustainability practices in micro-enterprises are often examined separately from accounting practices, even though everyday resource-use decisions may themselves contain implicit forms of accountability. This creates a conceptual gap concerning how sustainability accounting can be understood when formal reporting systems are weak or absent.

To address this gap, this study introduces the concept of Practical Accountability, defined as an informal and context-sensitive form of accountability through which micro-enterprises recognize, manage, and communicate the economic, social, and environmental consequences of their business activities. Practical Accountability does not seek to reproduce complex sustainability reporting standards at the micro-enterprise level. Instead, it translates sustainability principles into observable business practices, including efficient utilization of raw materials, reduction and reuse of production waste, local employment, community cooperation, and simplified financial recording. In the context of fish-cilok production, these practices can be interpreted through the Triple Bottom Line (TBL) perspective, encompassing economic value creation (*profit*), community and labor relationships (*people*), and responsible resource and waste management (*planet*) (Elkington, 2018).

The concept is particularly relevant to remote island economies because sustainability is closely connected to resource availability and community resilience (Nurdin et al., 2022). For micro-enterprises that depend on locally available fish and community labor, efficient resource utilization may simultaneously reduce production costs, generate additional value, strengthen local employment, and reduce production waste (Ghisetti et al., 2017). Therefore, sustainability should not necessarily be positioned as an additional administrative cost. When appropriately contextualized, it may function as an operational mechanism for improving efficiency and strengthening business resilience. This perspective also provides an opportunity to connect sustainability accounting with the broader discourse on the circular economy and sustainable local development (Geissdoerfer et al., 2017).

Despite the growing literature on sustainability practices among MSMEs, empirical evidence regarding how informal micro-enterprises in remote archipelagic regions operationalize sustainability through everyday accounting and resource-management practices remains limited (Ratten, 2020). In particular, little is known about how locally embedded practices such as *gotong royong*, utilization of low-value fish, informal financial recording, and reuse of production by-products can be interpreted as forms of sustainability accountability. Addressing this gap is important because imposing formal reporting systems without considering local capabilities may increase administrative burdens without necessarily improving sustainability outcomes.

Accordingly, this study aims to examine how sustainability accounting practices are informally embedded in the operations of fish-cilok micro-enterprises on Kangean Island and how these practices contribute to economic value creation and business resilience. Specifically, the study explores three dimensions: (1) how resource efficiency contributes to economic value creation; (2) how community-based practices support social sustainability and business resilience; and (3) how production waste and by-products are managed as part of environmental sustainability. Based on these findings, the study proposes a Simplified Sustainability Reporting (SSR) model that translates sustainability principles into practical indicators appropriate for micro-scale enterprises.

The study contributes to the sustainability accounting literature in two ways. First, it extends the discussion of sustainability accounting beyond formal reporting by conceptualizing Practical Accountability as a locally embedded form of sustainability practice among informal micro-enterprises. Second, it proposes a simplified reporting approach that connects material efficiency, community impact, environmental practices, and economic performance without imposing reporting structures disproportionate to the organizational capacity of micro-enterprises (Schaltegger et al., 2022). Empirically, the study provides evidence from a remote island context that remains relatively underrepresented in sustainability accounting research (Hossain et al., 2021). In this way, sustainability accounting is positioned not merely as a compliance-oriented reporting mechanism but as a practical instrument for resource stewardship, value creation, and resilience in micro-scale enterprises (Bebbington & Unerman, 2018).

LITERATURE REVIEW

a. Sustainability Accounting in Micro-Scale Enterprises

Sustainability accounting has evolved from a primarily financial-oriented accounting function toward a broader approach that incorporates economic, environmental, and social considerations into organizational decision-making (Schaltegger et al., 2022). In this perspective, accounting is not limited to recording monetary transactions but also provides information about how organizational activities affect resources, communities, and the environment (Bebbington & Unerman, 2018). The development of sustainability accounting is closely associated with the increasing recognition that long-term organizational performance cannot be separated from responsible resource management and social accountability (Adams, 2017).

However, the application of sustainability accounting in micro-scale enterprises differs substantially from that in large organizations (Spence et al., 2023). Micro-enterprises generally operate with limited financial resources, informal organizational structures, restricted accounting expertise, and relatively simple information systems (Rahman et al., 2021). Consequently, sophisticated sustainability reporting mechanisms may not be directly applicable to their operational circumstances (Larrinaga & Garcia-Torea, 2022). A recent systematic study of sustainability reporting practices in SMEs demonstrates that the literature remains fragmented across integrated reporting, corporate social responsibility reporting, SDG reporting, and circular-economy practices, indicating the need for approaches that are more appropriate to SME characteristics (Mio et al., 2020; Daddi et al., 2022).

The challenge is particularly significant in emerging economies, where micro-enterprises frequently combine formal and informal business practices (Azis et al., 2022). A recent review of social and environmental accounting in emerging-market SMEs identifies limited resources, regulatory gaps, and institutional constraints as important barriers to the adoption of formal sustainability accounting practices (Orazalin & Mahmood, 2023). Therefore, sustainability accounting for micro-enterprises should not necessarily be understood as the replication of reporting frameworks developed for larger organizations (Widodo et al., 2023). Instead, it can be conceptualized as an information and accountability mechanism that is proportional to organizational capacity and embedded in everyday business activities (Megahed et al., 2022).

In the Indonesian context, recent empirical evidence indicates that sustainability accounting and governance among MSMEs can be practiced informally and pragmatically, with emphasis on business continuity, social relationships, and ethical responsibility rather than formal sustainability reporting (Purwanto et al., 2023). This finding provides an important theoretical basis for examining sustainability accounting in remote micro-enterprises, where informal practices may constitute meaningful forms of accountability even when formal sustainability reports are absent (Nurdin et al., 2022).

b. Sustainability Accounting and the Triple Bottom Line

The Triple Bottom Line (TBL) provides an appropriate conceptual foundation for understanding sustainability practices in micro-enterprises because it connects organizational performance with three interrelated dimensions: profit, people, and planet (Elkington, 2018; Landrum & Ohsowski, 2022). The profit dimension concerns economic viability and value creation; the people dimension concerns employees, communities, and social relationships; while the planet dimension concerns environmental responsibility and resource preservation (Kuckertz & Wagner, 2023).

For micro-enterprises, these dimensions are rarely managed through separate sustainability departments or formal performance systems (Ratten, 2020). Instead, economic, social, and environmental considerations are often integrated into daily operational decisions (Cantele & Zardini, 2018). For example, reducing raw-material waste may simultaneously decrease production costs, increase product yield, and reduce environmental pressure (Ghisetti et al., 2017). Similarly, employing local workers can provide economic benefits to households while strengthening community relationships and labor availability (Yusuf et al., 2023).

This interconnectedness makes TBL particularly relevant to the fish-cilok production context. The utilization of locally available fish resources can represent an economic strategy through value creation while simultaneously influencing resource efficiency (Hossain et al., 2021). . Community-based labor practices may strengthen social sustainability, whereas the reuse or conversion of production by-products may contribute to circular resource management (Geissdoerfer et al., 2017).. Accordingly, TBL in micro-enterprises should be interpreted as an interconnected system rather than three isolated reporting categories (Bocken et al., 2022).

c. Practical Accountability as Contextual Sustainability Accounting

Formal sustainability reporting emphasizes standardized indicators, comparability, transparency, and stakeholder communication (Higgins et al., 2022).. These characteristics are

important for larger organizations but may create difficulties when transferred directly to micro-scale enterprises. The issue is not necessarily that micro-enterprises reject sustainability principles, but rather that sustainability is often practiced through informal routines that are not recognized as accounting or reporting activities.

This study therefore adopts the concept of Practical Accountability to describe a context-sensitive form of sustainability accountability. Practical Accountability refers to the process through which micro-enterprises recognize, manage, and demonstrate responsibility for the economic, social, and environmental consequences of their activities through simple and observable business practices. The concept consists of three characteristics. First, it is embedded, meaning that accountability occurs within ordinary production and business activities rather than through a separate reporting structure (Unerman & Chapman, 2023). Second, it is proportional, meaning that the complexity of accountability mechanisms corresponds to the scale and capabilities of the enterprise. Third, it is value-oriented, meaning that sustainability practices are assessed not only according to compliance but also according to their contribution to resource efficiency, community welfare, and business continuity (Stubbs & Cocklin, 2024). This conceptualization is consistent with emerging evidence that sustainability accounting among Indonesian MSMEs can be informal and pragmatic rather than formally reported (Pratama et al., 2024). It also responds to the broader literature suggesting that SME sustainability reporting requires approaches that reflect the specific organizational and resource constraints of smaller businesses (Johnson et al., 2023).

d. Local Wisdom, Social Capital, and Community-Based Accountability

Sustainability practices in micro-enterprises cannot be separated from their social and institutional context (Spence et al., 2023). In local communities, business relationships are frequently structured through trust, reciprocity, shared norms, and social networks. Such relationships can function as informal mechanisms for accountability because business actors are not accountable only through formal regulations but also through expectations established within their communities (Unerman & Chapman, 2023).

The concept of social capital is therefore relevant to understanding sustainability practices in remote island economies (Nurdin et al., 2022). Community cooperation can facilitate access to labor, information, raw materials, and informal financial support while reducing transaction costs (Yusuf et al., 2023). In the Indonesian context, the cultural principle of *gotong royong* provides an example of collective action in which individual economic activities are embedded within broader community relationships (Purwanto et al., 2023).

For micro-scale fish-cilok producers, local wisdom may influence how labor is recruited, how production resources are shared, how relationships with suppliers are maintained, and how production problems are collectively addressed (Widodo et al., 2023). These practices may not appear in conventional sustainability reports, yet they can generate measurable economic and social consequences (Cantele & Zardini, 2018). Consequently, local wisdom should not be treated merely as a cultural background variable but as a potential mechanism through which sustainability and accountability are operationalized (Pratama et al., 2024)..

e. Circular Economy and Resource Efficiency

Circular economy principles provide another important theoretical foundation for examining sustainability accounting in micro-scale food-processing enterprises (Geissdoerfer et al., 2017). The circular economy emphasizes maintaining the value of materials and resources through reduction, reuse, recovery, recycling, and value creation from residual materials (Bocken et al., 2022). For micro-enterprises, circular practices can be particularly important because efficient use of scarce resources can directly affect production costs and profitability (Megahed et al., 2022).

In fish processing, production residues and low-value fish may potentially be transformed into economically useful inputs or secondary products (Hossain et al., 2021). Such practices can create a

connection between environmental responsibility and economic performance (Ghisetti et al., 2017). Rather than treating waste management solely as an environmental obligation, a circular perspective recognizes waste reduction and resource recovery as potential sources of additional value (Daddi et al., 2022).

This perspective is important for the present study because the utilization of *ikan rucah* and the management of fish-processing by-products may simultaneously represent resource efficiency, cost management, and environmental responsibility. Consequently, sustainability accounting should capture not only expenditures related to environmental management but also the economic value generated through more efficient resource utilization. Recent research on SMEs similarly connects sustainability reporting with circular economy practices, indicating that sustainability information can be used to communicate how smaller businesses manage economic, environmental, and social dimensions of their activities.

f. Sustainability Accounting, Business Resilience, and Value Creation

The ultimate relevance of sustainability accounting for micro-enterprises lies in its ability to support decision-making and organizational resilience. Sustainability practices that require additional resources without generating identifiable benefits may be difficult for micro-enterprises to maintain. Conversely, practices that simultaneously reduce costs, improve resource efficiency, strengthen community relationships, and reduce environmental risks can become integral components of business resilience (Nurani,dkk 2025).

Recent Indonesian research on green accounting and MSMEs also reports a relationship between green accounting adoption and sustainability performance, highlighting the potential of environmental accounting practices to support broader organizational outcomes (Indirastuti & Mutamimah, 2023). Similarly, research examining ESG-related practices among Indonesian SMEs highlights the importance of understanding the barriers and benefits associated with incorporating sustainability principles into SME operations.

From this perspective, sustainability accounting can be understood as a mechanism connecting resource management to value creation. For micro-enterprises, value creation may occur through several pathways: reducing raw-material costs, increasing production efficiency, utilizing by-products, reducing waste-related expenses, maintaining reliable local labor, and strengthening relationships with customers and communities (Bu, dang 2020). These pathways suggest that sustainability does not necessarily represent an external cost imposed on micro-enterprises. Instead, when integrated into operational decision-making, sustainability can become a source of efficiency and resilience.

g. Research Gap and Conceptual Positioning

The literature reviewed above reveals three important gaps. First, existing sustainability accounting literature has predominantly developed around formal organizations and standardized reporting mechanisms, while the informal practices of micro-scale enterprises remain comparatively underexplored (Dhar, 2026). Second, sustainability research on SMEs has frequently focused on urban and formally structured business environments, leaving remote archipelagic communities insufficiently represented. Third, the relationship between local wisdom, informal accountability, resource efficiency, and sustainability accounting has not been adequately conceptualized as an integrated process.

This study addresses these gaps by positioning Practical Accountability as an intermediary concept between everyday local business practices and sustainability accounting. Rather than requiring micro-enterprises to adopt complex reporting systems, Practical Accountability translates sustainability principles into observable and economically meaningful practices. The conceptual relationship proposed in this study can be summarized as follows:

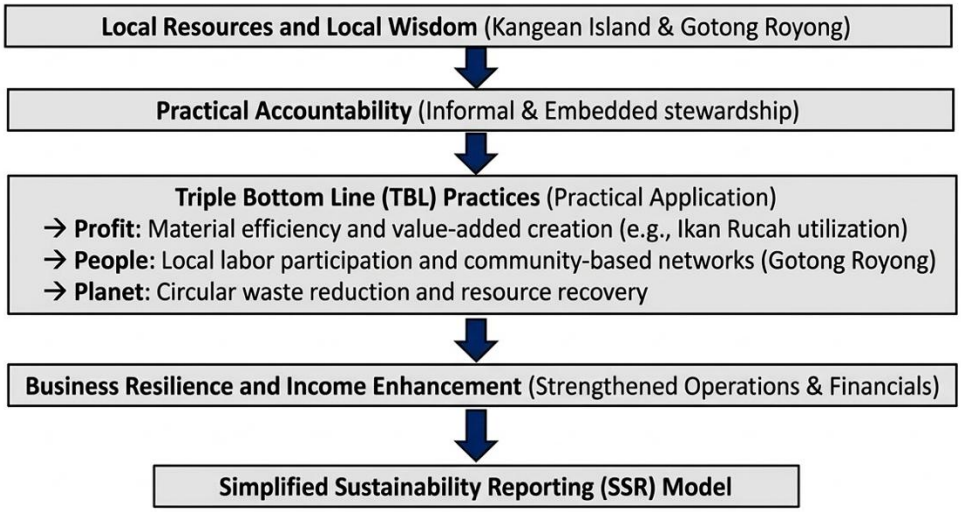


Figure 1. Conceptual Model : SSR for Remote Island Micro – Enterprise

Based on this conceptual positioning, the study argues that sustainability accounting in micro-scale enterprises should be context-sensitive, proportional, operationally simple, and economically meaningful. The proposed Simplified Sustainability Reporting model therefore does not seek to replace established sustainability standards but to translate their fundamental principles into an accounting and reporting mechanism that can be realistically implemented by micro-enterprises in remote island communities (Muslimin, dkk, 2026)

METHODOLOGY

This study employed a qualitative exploratory approach with a case study design to examine sustainability accounting practices among fish-cilok micro-enterprises on Kangean Island, Sumenep Regency, Indonesia. The study aimed to identify informal sustainability practices and reconstruct them into a practical accounting model appropriate for micro-scale enterprises (yin, 2018). The study involved 15 purposively selected key informants, consisting of 12 fish-cilok producers and 3 local government officials from relevant fisheries and MSME institutions. The producers had a minimum of three years of production experience, while government officials were selected based on their knowledge of local fisheries and MSME development. Data were collected through semi-structured interviews, field observations, and document analysis (Creswell & Creswell, 2018). The interviews focused on three domains: financial and resource management (*Profit*), community and labor practices (*People*), and raw-material utilization and waste management (*Planet*).

Data were analyzed using the interactive qualitative analysis model of Miles, Huberman, and Saldaña (2020), involving data condensation, data display, and conclusion drawing and verification. The collected data were coded thematically and subsequently organized according to the Triple Bottom Line (TBL) framework. The three TBL dimensions were contextually adapted to the characteristics of micro-enterprises: Profit was interpreted as *Value-Added Efficiency*, emphasizing raw-material utilization, cost efficiency, and simple cash-flow recording; People was interpreted as *Social Capital and Local Empowerment*, emphasizing *gotong royong*, local employment, and community-based relationships; and Planet was interpreted as *Resource Stewardship*, emphasizing material efficiency, waste reduction, and the reuse of fish-processing by-products.

Data credibility was strengthened through source and methodological triangulation by comparing information from producers and government officials and cross-checking interview findings with field observations and available documents (Denzin, 2017). The researchers also maintained

analytical records to ensure consistency between empirical evidence and emerging themes. Relevant literature published between 2021 and 2026 on sustainability accounting, green accounting, MSMEs, circular economy, and blue-economy development was used to contextualize and compare the empirical findings. The literature served as a theoretical reference rather than a separate research method.

Finally, the findings were synthesized into a Simplified Sustainability Reporting (SSR) model consisting of three practical dimensions: Value-Added Efficiency, Social Capital and Local Empowerment, and Resource Stewardship. The model was designed to translate sustainability principles into simple indicators that can be incorporated into the routine accounting and operational practices of micro-enterprises without imposing complex reporting requirements. Figure 2. Research Methodological Framework:

Research Context → Participant Selection → Interviews, Observations, and Documents → Data Triangulation → Thematic Coding → TBL Analysis → Practical Accountability → Simplified Sustainability Reporting (SSR).

RESULT AND DISCUSSION

a. Deconstructing the Profit Dimension: From Cost Recording to Value-Added Efficiency

The findings indicate that fish-cilok producers on Kangean Island manage the economic dimension of sustainability primarily through resource efficiency rather than formal sustainability accounting. Interviews and field observations revealed that producers intentionally utilize low-value fish (*ikan rucah*) as a major production input. Although this practice is not formally recorded as sustainability accounting, it reflects an implicit mechanism of value creation through the conversion of relatively low-value marine resources into higher-value processed products (Agyabeng-Mensah et al., 2021; Purnomo et al., 2023)..

This practice demonstrates that the economic dimension of sustainability in micro-enterprises can be understood beyond conventional cost recording. Instead of focusing exclusively on historical acquisition costs, producers emphasize the relationship between raw-material availability, production costs, product value, and sales revenue (Lako, 2023). This study refers to this practice as Value-Added Efficiency, namely the ability to maximize economic value from locally available resources while minimizing material losses.

Table 1. Deconstruction of Profit Indicators in Fish-Cilok Micro-Enterprises

Conventional Accounting Perspective	Practical Sustainability Indicator	Empirical Practice in Kangean	Expected Economic Contribution
Historical cost	Value-Added Efficiency	Utilization of low-value fish (*ikan rucah*)	Lower material costs and increased product value
Complex financial statements	Simplified Cost Tracking	Recording major production costs and sales	Improved control over operational expenses
Resource acquisition	Local Resource Utilization	Use of locally available fish and community resources	Reduced dependence on external inputs
Short-term profit	Resource-Based Value Creation	Converting low-value resources into processed products	Strengthened business resilience

Source: Authors' analysis based on interviews, observations, and document analysis.

The use of *ikan rucah* is particularly important because it illustrates the relationship between environmental resource efficiency and economic value creation (Contreras et al., 2024). Rather than treating low-value fish as an undesirable residual resource, producers incorporate it into the production process and transform it into a commercially valuable product. This practice reflects a circular-economy logic in which the economic value of available resources is extended through processing and reuse (Afrina et al., 2023; Diantoro et al., 2024).

The findings also indicate that producers generally rely on simple financial calculations rather than formal financial statements. They tend to prioritize information directly relevant to daily decision-making, such as raw-material prices, production expenses, selling prices, and cash received. This supports the argument that sustainability accounting for micro-enterprises should be proportional to their organizational capacity (Fahmie et al., 2025; Williams & Schaefer, 2021). Complex accounting systems may not necessarily generate additional value when producers primarily require simple information for operational decisions.

From a Resource-Based View perspective, locally available marine resources can represent a strategic resource when they are effectively transformed into economically valuable products (Barney, 1991; Purnomo et al., 2023). The combination of local raw materials, production knowledge, community labor, and market familiarity constitutes a resource configuration that is difficult to reproduce outside the local context. Thus, sustainability practices can contribute to competitive advantage not only by reducing environmental impacts but also by strengthening the economic resilience of the enterprise (Agyabeng-Mensah et al., 2021).

The findings further suggest that the relationship between sustainability and profitability should not be interpreted as a simple trade-off. In the Kangean case, efficient utilization of local resources simultaneously supports cost efficiency, waste reduction, and value creation. This finding is consistent with recent research emphasizing the potential of sustainability and circular-economy practices to improve resource efficiency and organizational resilience among SMEs (Lako, 2023; Utami et al., 2023). However, the study does not claim that all producers achieve identical financial outcomes. The economic benefits vary according to raw-material availability, production volume, selling prices, and market conditions. Therefore, the contribution of Value-Added Efficiency should be understood as an operational mechanism for improving economic resilience, rather than as a standardized percentage increase in profitability. Overall, the evidence demonstrates that the *Profit* dimension of sustainability accounting can be reconstructed for micro-enterprises from formal financial reporting toward simple, decision-oriented resource and value tracking. In the Kangean context, sustainability becomes economically meaningful when accounting information helps producers answer three practical questions: what resources are being used, how efficiently are they converted into products, and how much economic value is generated?

b. Social Dimension (People): From Formal Social Reporting to Relational Accountability

The findings indicate that the People dimension of sustainability among fish-cilok micro-enterprises on Kangean Island is primarily expressed through community relationships, local employment, and *gotong royong* rather than formal social reporting (Lukianto, 2021; Utami et al., 2023). Producers rarely use standardized indicators to measure social performance. Instead, social responsibility is embedded in everyday interactions with workers, suppliers, customers, and the surrounding community.

This pattern suggests a form of Relational Accountability, in which trust, reciprocity, and community participation function as informal mechanisms of social accountability (Diantoro et al., 2024; Williams & Schaefer, 2021). The producers' relationships with local workers and fish suppliers are maintained not only through monetary transactions but also through social obligations and mutual

assistance. Such relationships facilitate access to labor and raw materials while strengthening the continuity of production.

Table 2. Deconstruction of the People Dimension

Conventional Social Indicator	Practical Accountability in Kangean	Empirical Practice	Sustainability Contribution
Formal social reporting	Relational Accountability	Trust, reciprocity, and *gotong royong*	Stronger community relationships
Formal employment indicators	Local Empowerment	Recruitment of local workers	Local income generation and employment
CSR expenditure	Community-Based Contribution	Mutual assistance and support among producers and workers	Social cohesion
Formal HR development	Informal Knowledge Sharing	Transfer of fish-processing skills among workers	Preservation of local knowledge
Supplier relationship metrics	Relational Loyalty	Long-term relationships with local fish suppliers	Greater supply continuity

Source: Authors' analysis based on interviews, observations, and document analysis.

One important finding concerns the role of local women in the production process. Interviews indicate that women participate in activities such as fish cleaning, preparation, processing, packaging, and other supporting activities. Their involvement provides an additional source of household income while simultaneously strengthening the local production network. Rather than operating through formal diversity and inclusion policies, gender participation emerges organically from the structure of the local production system.

The practice of *gotong royong* also represents an important component of the social sustainability of the fish-cilok industry. Producers and workers frequently rely on mutual assistance when facing fluctuations in production, labor requirements, or resource availability (Lukianto, 2021). Such cooperation reduces dependence on formal organizational mechanisms and creates a social environment in which information, skills, and assistance can be exchanged relatively easily. These findings support the concept of Practical Accountability proposed in this study. Social accountability at the micro-enterprise level does not necessarily require formal social reports when accountability is already embedded in relationships and everyday practices (Fahmie et al., 2025). In the Kangean context, trust and reciprocity function as forms of social capital that support business continuity and reduce potential friction in labor and supplier relationships.

The findings are consistent with the broader literature emphasizing the importance of social capital and stakeholder relationships in SME sustainability (Williams & Schaefer, 2021). Socially embedded business relationships can strengthen trust, facilitate resource access, and contribute to organizational resilience. However, the Kangean case extends this perspective by demonstrating how local wisdom can operate as an informal accounting logic, in which social value is recognized through

participation, reciprocity, employment, and community relationships rather than through standardized social indicators (Diantoro et al., 2024; Lukianto, 2021)..

From a sustainability accounting perspective, the People dimension should therefore be reconstructed from formal social disclosure toward relational and community-based indicators. For micro-enterprises, relevant information may include the number of local workers involved, community participation, continuity of supplier relationships, opportunities for skill transfer, and perceived community benefits (Fahmie et al., 2025; Utami et al., 2023). Such indicators are simpler than conventional social reporting but remain meaningful for assessing the social contribution of the enterprise. Overall, the evidence demonstrates that social sustainability in the Kangean fish-cilok industry is not an additional activity separated from business operations. Instead, social capital is embedded within the production system itself. *Gotong royong*, local employment, knowledge sharing, and trust-based relationships simultaneously support community welfare and operational resilience. This finding reinforces the argument that sustainability accounting for micro-enterprises should recognize locally embedded social practices as legitimate forms of accountability.

c. Environmental Dimension (Planet): From Green Accounting to Resource Stewardship

The findings reveal that environmental sustainability among fish-cilok micro-enterprises on Kangean Island is primarily practiced through resource stewardship and waste management rather than formal environmental reporting (Afrina et al., 2023; Lako, 2023). Producers generally do not calculate carbon footprints, prepare environmental reports, or apply sophisticated environmental accounting techniques. Instead, environmental considerations are embedded in decisions concerning raw-material utilization, production efficiency, packaging, and the handling of production by-products.

This practice represents a contextual form of environmental accountability in which environmental responsibility is directly connected to resource efficiency and business continuity (Purnomo et al., 2023). For micro-enterprises that depend heavily on marine resources, maintaining the availability and quality of local resources is not only an environmental concern but also an economic necessity.

Table 3. Deconstruction of the Planet Dimension

Conventional Environmental Indicator	**Practical Accountability in Kangean**	**Empirical Practice**	**Sustainability Contribution**
Carbon footprint and emission reporting	Resource Stewardship	Efficient utilization of fish resources	Reduced material losses
Life Cycle Assessment (LCA)	Material Efficiency	Monitoring raw-material use during production	Improved production efficiency
Formal waste-management reporting	Waste-to-Value	Reuse or recovery of fish-processing by-products	Reduced waste and potential additional value
Environmental certification	Local Environmental Responsibility	Community-based efforts to maintain resource availability	Protection of local resource systems
Formal ESG disclosure	Narrative Stewardship	Communicating environmental responsibility through everyday practices	Greater local awareness and accountability

Source: Authors' analysis based on interviews, observations, and document analysis.

One important finding concerns the management of fish-processing by-products. Field observations indicate that producers attempt to minimize unused materials and identify opportunities for reuse where economically and practically feasible. Fish residues such as scales, bones, and other processing by-products may have potential secondary uses rather than being treated exclusively as waste (Afrina et al., 2023). This practice reflects a waste-to-value orientation, in which residual materials are considered potential resources within a more circular production system (Agyabeng-Mensah et al., 2021).

The environmental dimension is therefore closely connected to the economic dimension discussed previously. Efficient material utilization can reduce unnecessary resource losses, while the recovery or reuse of by-products can potentially create additional economic value (Contreras et al., 2024; Purnomo et al., 2023). This finding supports the circular-economy perspective that sustainability can be achieved by extending the useful value of materials and reducing resource waste.

The findings also indicate that environmental responsibility is influenced by the geographical characteristics of Kangean Island. Because producers depend on locally available marine resources, resource depletion or declining resource quality could directly affect their future production capacity (Utami et al., 2023). Environmental stewardship therefore functions as a form of business-risk management. Protecting the resource base means protecting the continuity of the enterprise itself. However, the study does not find evidence that producers have adopted sophisticated environmental accounting instruments such as carbon accounting, Life Cycle Assessment, or formal Material Flow Cost Accounting (MFCA). Rather, their practices are predominantly informal and operational. Producers tend to focus on questions that are immediately relevant to production: how much raw material is used, how much becomes a product, what remains after processing, and whether the residual material can still be utilized.

This finding reinforces the concept of Practical Accountability. For micro-enterprises, environmental accounting does not necessarily need to begin with complex environmental metrics. It can begin with simple records of material inputs, production outputs, losses, and recovered materials (Fahmie et al., 2025; Williams & Schaefer, 2021). Such information can provide a basic foundation for understanding both environmental performance and production efficiency. The findings are consistent with the broader literature on sustainability and circular economy practices among SMEs, which emphasizes the importance of resource efficiency, waste reduction, and the integration of environmental considerations into operational decision-making (Agyabeng-Mensah et al., 2021; Lako, 2023). However, the Kangean case extends this discussion by demonstrating that environmental accountability can emerge informally through local production practices even in the absence of formal sustainability reporting systems.

From this perspective, the Planet dimension can be reconstructed from formal environmental disclosure toward Resource Stewardship, consisting of three practical principles: efficient resource utilization, waste reduction and recovery, and protection of the local resource base (Afrina et al., 2023; Diantoro et al., 2024). These principles are more compatible with the organizational capacity and operational realities of micro-enterprises. Overall, the findings demonstrate that environmental sustainability in the fish-cilok industry is not necessarily an additional cost imposed on producers. Instead, resource stewardship is closely connected to production efficiency, resource availability, and long-term business resilience. In the Kangean context, protecting the resource base simultaneously contributes to protecting the economic future of the enterprise.

d. Simplified Sustainability Reporting (SSR) Model for Archipelagic Micro-Enterprises

The synthesis of the three dimensions identified in the findings Value-Added Efficiency (Profit), Relational Accountability (People), and Resource Stewardship (Planet) provides the basis for developing a Simplified Sustainability Reporting (SSR) Model for micro-scale enterprises (Fahmie et al., 2025). The model is designed not to replicate complex sustainability reporting frameworks but to

translate their fundamental principles into practical indicators that can be incorporated into the daily operations of micro-enterprises (Utami et al., 2023; Williams & Schaefer, 2021).

The proposed SSR model consists of three integrated components: Direct Material Tracking, Community Impact Measurement, and Revenue and Value-Creation Analysis.

1. Direct Material Tracking

   The first component focuses on the relationship between material inputs and production outputs. Producers can record the quantity of fish used, supporting ingredients, energy consumption, production output, and residual materials (Afrina et al., 2023).. These simple records enable producers to identify material losses and evaluate yield efficiency. In the fish-cilok context, tracking the relationship between *ikan rucah* input and finished-product output provides practical information for production decisions. Rather than requiring sophisticated environmental accounting, this approach enables producers to identify where material losses occur and how resource utilization can be improved. Consequently, environmental accountability becomes directly connected to cost efficiency and value creation (Purnomo et al., 2023)..

2. Community Impact Measurement

   The second component captures the social contribution of the enterprise through simple indicators related to local employment, community participation, supplier relationships, and knowledge sharing (Lukianto, 2021).. These indicators translate the concept of social sustainability into information that is relevant to micro-enterprise operations. In Kangean, practices such as *gotong royong*, local labor participation, and trust-based relationships with suppliers constitute important elements of the production system. Recording these practices allows producers to recognize social capital as an operational resource rather than treating social responsibility solely as an external CSR activity (Diantoro et al., 2024. Stable relationships with local workers and suppliers can contribute to production continuity and community-based economic resilience.

3. Revenue and Value-Creation Analysis

   The third component focuses on the economic consequences of sustainability practices. Instead of relying only on simple cash-in and cash-out records, producers can identify the relationship between resource efficiency, production volume, product value, and revenue (Agyabeng-Mensah et al., 2021; Lako, 2023). The analysis may include the main product, potential secondary products derived from production by-products, and changes in production costs resulting from more efficient resource utilization. This component enables producers to assess whether sustainability-related practices contribute to value creation and business resilience. Importantly, the SSR model does not assume that every environmental or social practice will automatically increase revenue. Rather, it provides a mechanism for producers to identify and evaluate potential economic benefits associated with resource efficiency, social stability, and waste reduction (Contreras et al., 2024).

Table 4. Simplified Sustainability Reporting (SSR) Model

SSR Dimension	Practical Indicators	Data Source	Expected Contribution
Direct Material Tracking	Raw-material input, production output, material loss, energy use	Production records and observation	Resource efficiency and cost control
Community Impact Measurement	Local workers, community participation, supplier relationships, knowledge sharing	Interviews and simple records	Social capital and production continuity
Revenue & Value-Creation Analysis	Sales, production costs, product value, secondary products	Sales and financial records	Value creation and business resilience

Source: Developed by the authors based on empirical findings.

The SSR model demonstrates that simplifying sustainability accounting does not mean eliminating accountability. Instead, it involves selecting information that is material, understandable, and directly useful for micro-enterprise decision-making (Fahmie et al., 2025). The model therefore shifts sustainability accounting from an externally oriented reporting mechanism toward an internally useful management instrument. The relationship among the findings can be summarized as follows:

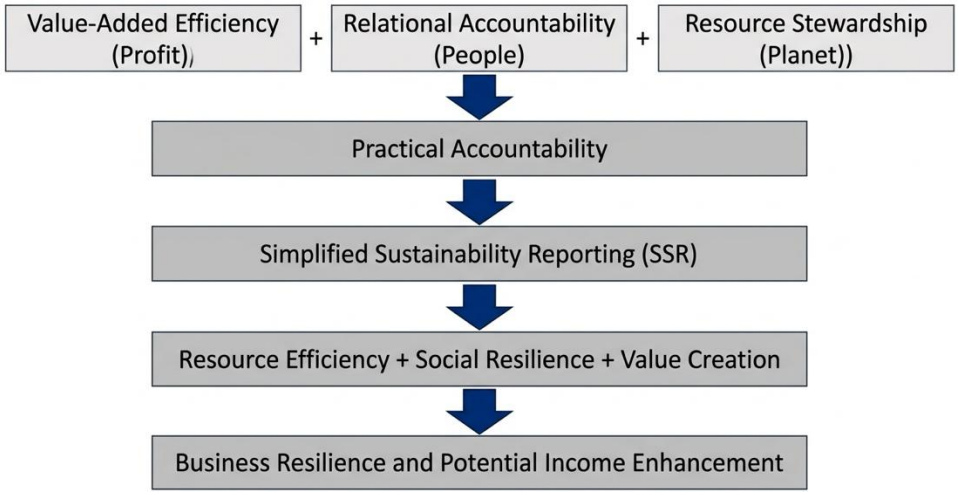


Figure 2. The SSR Model

The model provides a contextual contribution to sustainability accounting research by demonstrating how global sustainability principles can be translated into simple practices suitable for micro-enterprises in remote archipelagic communities (Utami et al., 2023). Rather than imposing complex reporting requirements, the SSR model emphasizes information that producers can realistically collect and use. In this sense, sustainability accounting becomes a practical mechanism for connecting resource stewardship, community relationships, and economic decision-making (Fahmie et al., 2025; Lako, 2023). The proposed model should nevertheless be regarded as a contextual conceptual model, rather than a universally applicable reporting standard. Its indicators require further testing across different types of micro-enterprises and geographical settings. Future research can quantitatively evaluate whether the adoption of SSR improves resource efficiency, profitability, and business resilience over time.

CONCLUSION

This study finds that sustainability practices among fish-cilok micro-enterprises on Kangean Island are embedded in everyday business activities rather than formal accounting systems. The Triple Bottom Line is contextually reconstructed into Value-Added Efficiency (Profit), Relational Accountability (People), and Resource Stewardship (Planet). These practices demonstrate that sustainability can support resource efficiency, community resilience, and business continuity.

The study proposes a Simplified Sustainability Reporting (SSR) Model comprising Direct Material Tracking, Community Impact Measurement, and Revenue and Value-Creation Analysis. The model provides a practical alternative to complex sustainability reporting for micro-enterprises. The Sumenep Government is encouraged to develop a simple digital accounting tool based on these indicators. Given the qualitative and context-specific nature of this study, future research should test the SSR model across different micro-enterprise sectors and geographical contexts.

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ETHICAL APPROVAL

This study involved interviews and field observations with adult participants. Prior to data collection, participants were informed about the purpose of the study, the voluntary nature of their participation, and the confidentiality of the information provided. Informed consent was obtained from all participants. No personally identifiable or sensitive personal information is reported in this article.

DISCLOSURE STATEMENT

The authors declare that there are no conflicts of interest related to the research, authorship, or publication of this article. The authors have no financial or personal relationships that could have influenced the findings or interpretation of the study.

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