

COMPARATIVE ANALYSIS IN INDIGENOUS WOMEN'S ECOLOGICAL PRACTICES ACROSS INDONESIA: A SYSTEMATIC LITERATURE REVIEW

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ABSTRACT

Indigenous women in Indonesia have long practiced ecological management and sustainable resource use, deeply embedded in their cultural beliefs, traditional wisdom, and strong connection to the land. However, their specific ecological practices have been the subject of limited research, especially compared to broader studies of the relationship between gender and ethnicity in sectors such as mining. These existing studies often highlight negative impacts on women in general but focus less on the specific practices of indigenous women, especially in relation to their contributions to biodiversity conservation and sustainable use of natural resources. Recognizing this gap, this research aims to conduct an in-depth analysis of the ecological practices of indigenous women in various regions of Indonesia, focusing on their role in environmental conservation and sustainable development. The motivation for this research is to understand how these practices, shaped by cultural, traditional, and land-based relationships, contribute to ecological management and provide lessons for sustainable living. To achieve this, this study used a systematic literature review. The literature review will involve a comprehensive examination of existing academic literature, using databases such as JSTOR, Scopus, and local Indonesian research repositories. Literature selection criteria will include relevance to indigenous practices, focus on ecological management, and contribution to biodiversity conservation. Although specific findings have not been presented, the study expects to reveal a wide variety of indigenous ecological practices. This is expected to include traditional methods of land and resource management, contributions to the resilience of local ecosystems, and sustainable practices passed down from generation to generation. This study aims to highlight the important role of indigenous women in maintaining biodiversity and adapting to environmental change. A multidimensional approach that considers the institutionalization of gender and ethnicity in mining governance, as well as the role of gender and ethnic identity, will be adopted. The findings from this literature review and field study will make a significant contribution to our understanding of the rich ecological knowledge and practices of indigenous women in Indonesia. They will also highlight the importance of incorporating these practices into broader conservation and sustainability efforts, providing policy recommendations for a more inclusive and holistic environmental approach.

Keywords: *Comparative Analysis of Ecological Practices, Indigenous Women, Literature Review.*

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INTRODUCTION

Indigenous women in Indonesia have long been practicing ecological management and sustainable resource utilization, deeply rooted in their cultural beliefs, traditional wisdom, and strong connection to the land. However, their specific ecological practices have been the subject of limited research, particularly in comparison to the broader studies on the relationship between gender and ethnicity in sectors like mining. These existing studies often highlight the negative impacts on women in general but lack a focus on the distinct practices of indigenous women, especially in relation to their contribution to biodiversity preservation and sustainable natural resource use. Recognizing this gap, this study aims to conduct an in-depth analysis of the ecological practices of indigenous women across various regions of Indonesia, focusing on their role in environmental conservation and sustainable development. The motivation for this research is to understand how these practices, shaped by cultural,

traditional, and land-based connections, contribute to ecological management and offer lessons for sustainable living.

To achieve this, the study employs a systematic literature review. The literature review will involve a comprehensive examination of existing academic literature, using databases such as JSTOR, Scopus, and local Indonesian research repositories. Criteria for literature selection will include relevance to indigenous practices, focus on ecological management, and contributions to biodiversity conservation. While specific findings are yet to be presented, this research anticipates uncovering a rich variety of indigenous ecological practices (Blesia & Ratang, 2016). These are expected to include traditional methods of land and resource management, contributions to local ecosystem resilience, and sustainable practices passed down through generations. The study aims to highlight the crucial role of indigenous women in preserving biodiversity and adapting to environmental changes.

A multidimensional approach that considers the institutionalization of gender and ethnicity in mining governance, as well as the role of gender and ethnic identities, will be adopted. The findings of this literature review and field study will contribute significantly to our understanding of the rich ecological knowledge and practices of indigenous women in Indonesia. They will also highlight the importance of incorporating these practices into broader conservation and sustainability efforts, providing policy recommendations for a more inclusive and holistic approach to environmental management.

Indigenous women in Indonesia play a pivotal role in conserving biodiversity and practicing sustainable ecological knowledge (Syafi'i & Firdaus, 2017). In various regions, these communities exhibit unique methods that intertwine their cultural identity with environmental stewardship. The Serawai people, for instance, have a rich tradition of farming practices encapsulated in the celako kemali method. (Suminar, 2023) observes that the first generation maintains all 19 types of celako kemali, the subsequent generations show a nuanced approach. The second generation, while aware of all 19 types, makes minor modifications to five types, retaining the essence of their knowledge. Interestingly, the third generation, influenced by external sources like village elders, teachers, and media, abandons three types of celako kemali. This generational shift highlights a dynamic balance between cultural preservation and adaptation, reflecting the community's response to changing environmental and social landscapes. The research underscores the importance of traditional ecological knowledge in environmental stewardship and the complexities involved in its transmission across generations.

The challenges faced by marginalized women in customary communities, particularly in accessing natural resources and local leadership, are significant. The study by (Wibowo et al., 2023) delves into the role of marginalized women in customary communities in Bali, Indonesia, with a focus on their involvement in social forestry. The research method combines qualitative approaches like actor-mapping, in-depth interviews, and field observations, providing a multifaceted understanding of women's roles in forest management and their socio-economic positions. The study reveals that despite the challenges of a rigid cultural system and limited policy support for gender equality, women actively contribute to preserving ecological knowledge and practices. Their involvement, however, is often indirect and limited by social and cultural norms. The research underscores the need for policy reforms

and increased support for women's direct participation in decision-making and forest management to harness their potential fully.

In South Sulawesi Province, the Ammatoa community demonstrates an integrated approach to sustainable development. (Daniel et al., 2021) notes that their methods, deeply rooted in indigenous knowledge, are multifaceted: (1) Social-Ecological System Framework: They have established a unique system managing social, economic, and institutional aspects based on traditional values. (2) Customary Values and Lifestyle: These guide their daily behaviors and practices, emphasizing simplicity, unity, and environmental harmony. (3) Resource Management and Conservation: The Ammatoa utilize local resources responsibly, ensuring sustainability in agriculture, weaving, and other livelihoods, and maintain a balanced relationship with their environment. (4) Sustainable Settlements: Their settlements reflect a deep respect for nature, using local, environmentally friendly materials, and maintaining traditional construction methods. (5) Health Practices: They rely predominantly on traditional medicine, influenced by a combination of environmental, personal, and mystical factors. (6) Forest Management and Protection: The community has strict rules for forest conservation, preventing over-exploitation and preserving biodiversity.

This integrated approach contributes significantly to achieving Sustainable Development Goals 15 (Life on Land) and 12 (Responsible Consumption and Production), demonstrating the vital role of indigenous knowledge in environmental sustainability (Dharmono et al., 2013) (Andesmora et al., 2017).

(Lee et al., 2021) conducted a comprehensive study on the Mentawai people's traditional knowledge system, *arat sabulungan*, highlighting its importance in conserving Siberut's biodiversity. They employed various methods including observations of daily activities, community surveys with 494 participants, key informant interviews with 21 informants, and plant collection and identification. Their results showed that Mentawai people have ethnobotanical uses for at least half of all plant species recorded, and although 98% of respondents recognized the importance of this knowledge for the future, there is a significant threat to its continuation. The study emphasizes the critical role of Mentawai indigenous practices in biodiversity conservation.

(Situmeang et al., 2023) conducted a qualitative study using in-depth interviews and observations in Kampung Darim, focusing on the experiences of women in relation to the failing food system. Their research found that women in this community are particularly vulnerable to exploitation, including early marriage and sexual and reproductive health threats, due to the failure of the food system and the commodification of natural resources. This situation is exacerbated by economic vulnerability and patriarchal practices. The study emphasizes the need for developing the food system by considering women as equal stakeholders, highlighting that women's empowerment is crucial for sustainability and resilience in these communities.

In summary, these studies collectively underscore the importance of indigenous women's roles in ecological conservation and sustainable practices in Indonesia. They illuminate the challenges faced by these communities, particularly women, and emphasize the need for preserving traditional knowledge and empowering women to ensure ecological sustainability and community resilience. The hypothesis derived from these studies is that the integration of indigenous women's knowledge and practices into environmental stewardship

and sustainable development significantly contributes to the conservation of biodiversity and the attainment of environmental sustainability goals. However, this contribution is often hindered by socio-cultural barriers and inadequate policy support. Therefore, empowering indigenous women and incorporating their traditional ecological knowledge in environmental policies can enhance biodiversity conservation and sustainable resource management. This hypothesis underscores the importance of recognizing and supporting the role of indigenous women in environmental sustainability efforts, both locally and globally. Their traditional knowledge, daily practices, and unique perspectives are indispensable for preserving biodiversity and managing natural resources in a sustainable manner. However, it is also vital to address the broader socio-economic challenges these women face to fully realize their potential in conservation efforts.

METHOD

In this detailed comparative study, the author meticulously adopted a systematic and comprehensive methodology for evaluating the representation of women in research articles. This method involved a structured and precise process, designed to ensure an exhaustive analysis and synthesis of data. The approach considered various variables, enabling a holistic and nuanced understanding of the extent and nature of women's inclusion in these scholarly studies. This in-depth examination aimed to provide insights into the patterns and trends of gender representation in academic research. The following is the detail steps:

1. Literature Collection and Selection

The initial step involved an extensive literature search using academic databases such as JSTOR and Google Scholar. The author applied the keywords "Women Indigenous Ecological Practices Across Indonesia" and "Indigenous Ecological Practices Across Indonesia" to gather a wide range of articles. Through a process of screening titles and abstracts, and applying specific inclusion and exclusion criteria, the author refined her selection to 23 pertinent articles.

2. Data Extraction

For data organization, the author developed a structured extraction form, incorporating fields for each of 10 key variables: Geographical Variation, Cultural Practices and Beliefs, Historical Context, and so forth. This enabled me to systematically extract and record relevant information from each article, ensuring consistency in data interpretation.

3. Qualitative Analysis

The author conducted a thematic analysis to identify common themes and patterns related to my variables within the literature. This involved coding the data according to these themes, with a particular focus on the representation and role of women in these studies. The qualitative analysis provided a deep understanding of the nuances in women's inclusion.

4. Comparative Analysis

Author's comparative analysis examined how each variable was treated across the different studies. The author looked for patterns, similarities, and differences, particularly focusing on the diverse methodologies and perspectives on women's roles in indigenous ecological practices.

5. Contextual Analysis

The author also conducted a contextual analysis to understand the broader historical, cultural, and socio-economic backgrounds of the regions studied. This helped in appreciating how these contexts might influence research findings and the understanding of ecological practices.

6. Synthesis and Interpretation

Integrating findings, the author formed a comprehensive understanding of the current state of research. This synthesis highlighted how the inclusion or exclusion of women's perspectives impacts the understanding of indigenous ecological practices.

7. Policy Implications and Recommendations

Based on the insights gained, the author identified potential policy implications and suggested how gender perspectives could be better incorporated into environmental policies. The author also made recommendations for future research, emphasizing the need for inclusive and gender-sensitive approaches.

8. Limitations and Reflection

The author reflected on the limitations of the study, acknowledging any potential biases and methodological constraints. This reflection was crucial for maintaining the integrity of the research.

This systematic and meticulous approach greatly enhanced the depth and accuracy of the analysis performed on the chosen articles. It shed light on the pivotal role that women play in indigenous ecological practices within Indonesia, highlighting their significant contributions and unique insights. This analysis not only showcased the integral part these women have in preserving and nurturing their local environments, but also underscored the importance of their knowledge and skills in the broader context of ecological sustainability and cultural heritage in Indonesia.

Definition of Key Variables and Their Importance

1. **Geographical Variation:** Understanding geographical variation is crucial because it highlights how location-specific factors like climate, topography, and natural resources influence the subject of study. This can reveal regional disparities or unique characteristics that may not be apparent in a more generalized analysis.
2. **Cultural Practices and Beliefs:** Cultural contexts significantly affect how people interact with their environment, each other, and various phenomena. By examining cultural practices and beliefs, your analysis can uncover how cultural factors shape behaviors, perceptions, and outcomes in different communities.
3. **Historical Context:** Historical context provides insight into the evolution of current trends, practices, or issues. It helps in understanding how past events, policies, and societal changes have shaped current conditions and perspectives, offering a deeper understanding of the present.
4. **Sustainability and Environmental Impact:** In an era of growing environmental concerns, analyzing sustainability and environmental impact is essential. This variable evaluates how different practices, policies, or phenomena affect ecological balance and long-term viability, which is crucial for proposing future sustainable solutions.
5. **Gender Roles and Empowerment:** Gender dynamics play a significant role in societal structure and individual experiences. Examining gender roles and empowerment reveals

disparities, challenges, and progress in gender equality, and how these aspects influence the subject matter of the articles.

6. **Economic Aspects:** Economic analysis helps understand the financial implications, resource allocations, and economic viability of different practices or phenomena. It's crucial for assessing affordability, economic benefits, and the overall economic impact on individuals, communities, and nations.
7. **Challenges and Threats:** Identifying challenges and threats provides a realistic view of the obstacles and risks associated with the subjects of study. This understanding is crucial for developing strategies to mitigate these issues and for informed decision-making.
8. **Comparison with Other Regions or Communities:** Comparing different regions or communities offers valuable insights into diverse approaches, outcomes, and innovations. This can lead to a broader understanding of how different contexts lead to varied results and can inspire cross-regional learning and collaboration (Dwiputra & Sundawa, 2023).
9. **Methodological Approaches:** Examining methodological approaches is essential for assessing the validity, reliability, and appropriateness of the research. It allows for a critical evaluation of how the research was conducted and whether the methods used were suitable for the research questions.
10. **Policy Implications:** Understanding policy implications is key to translating research findings into practical applications. This analysis can inform policymakers and stakeholders, guiding them in formulating or revising policies for better outcomes.

RESULTS AND DISCUSSION

The author gathered 23 scholarly articles delineates a comprehensive tableau of Indonesian research, multiyear, and encompassing a plethora of provincial studies, as shown in the following figure:

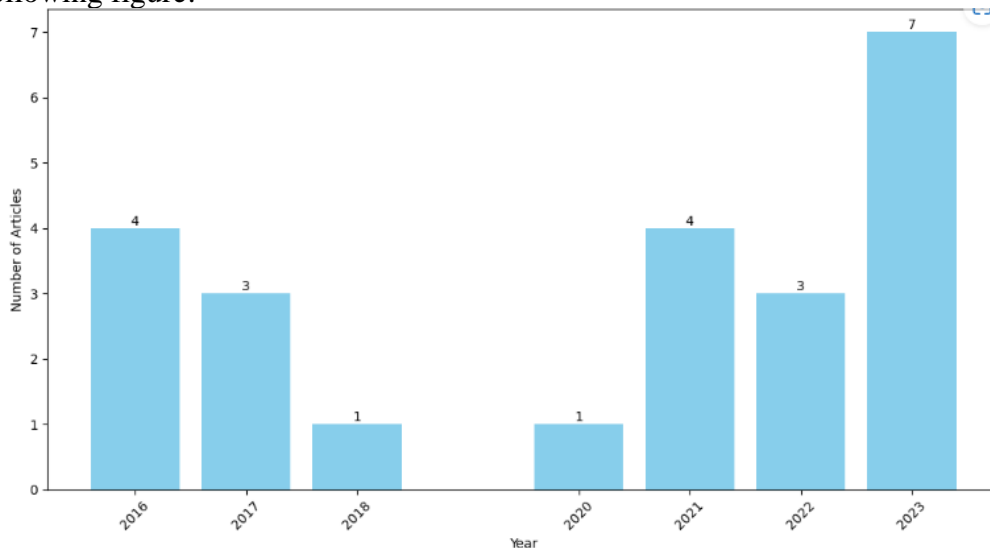


Figure 1. Number of Articles Based on Published Years

Above bar chart illustrating the distribution of articles published per year over an eight-year period, from 2016 to 2023, which are used by the author. A vertical axis, abelled “Number of Articles,” increments by integers and a horizontal axis, abelled “Year,” denotes the temporal dimension. The data suggest a fluctuating trend in the volume of published works. The year 2016 saw a total of 4 articles, with a slight decrease to 3 in 2017. A significant drop is noted in

2018 with only 1 article, followed by a period of minimal activity in 2019, maintaining the same low output. An uptick occurs in 2021, returning to 4 articles. The count recedes to 3 in 2022, before experiencing a notable increase to a peak of 7 articles in 2023. The bar chart, through its visual representation, conveys an overall variable pattern of publishing activity with a noteworthy increase in the most recent year displayed.

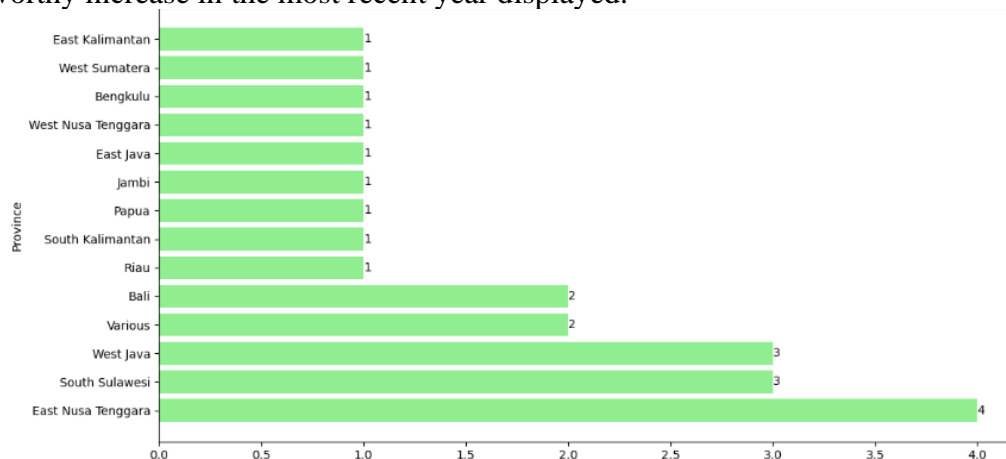


Figure 2. Number of Articles Based on Province where Research Conducted

The distribution of articles is primarily uniform across most provinces, with the majority having contributed one article each, including East Kalimantan, West Sumatera, Bengkulu, West Nusa Tenggara, East Java, Jambi, Papua, South Kalimantan, and Riau. Bali and a category labeled as 'Various' each account for two articles, indicating a modest increase in publication count. A slight uptick is noted in West Java and South Sulawesi, each with three articles. Notably, East Nusa Tenggara surpasses other provinces with the highest count of four articles. This visualization succinctly communicates the geographical distribution of research output or interest as reflected in the number of published articles, with East Nusa Tenggara emerging as the most prolific in the dataset presented.

Women in Sustainability and Environmental Impact

Based on analysis, out of the 23 articles which are based on geographic areas or communities, only six research articles specifically highlight the role of women in sustainability and environmental impact. These instances reflect the importance of gender roles in environmental conservation and sustainable practices, recognizing the contribution of women to these efforts. The roles and empowerment of women in these areas are, as follows:

1. South Kalimantan

The practices in South Kalimantan stand as a testament to an environmentally conscientious community. With a strategy that prioritizes non-intensive use of plants, the region underscores a harmonious relationship with nature, favoring conservation over exploitation. This approach extends to the societal fabric, where women are revered as custodians of wisdom, playing an essential role in educating the youth and ensuring that ancestral knowledge of sustainability is inherited, thereby nurturing a legacy of environmental stewardship.

2. Papua

Papua's commitment to environmental sustainability is evident in its emphasis on preserving nature. Here, ecological practices are not just methods but are deeply ingrained in the customary laws of the land, reflecting a profound respect for the environment that is integral to the community's way of life. Gender dynamics contribute to the region's resilience; men's fishing and women's agriculture are not just economic activities but a confluence of efforts that sustain the family and the larger community, showcasing a balanced partnership in maintaining the health of their environment.

3. West Nusa Tenggara

While the document does not detail West Nusa Tenggara's environmental policies, it illuminates the region's progressive gender roles. Women here are at the forefront of health and wellness as midwives and healers, embodying roles that go beyond traditional expectations. Their empowerment in reproductive healthcare signifies a community investing in women's experiences and expertise, recognizing them as integral to the region's social and health infrastructure.

4. Bali

In Bali, the customary forests are not just a part of the landscape but the backbone of environmental sustainability. These forests represent a living tradition of ecological balance and community management. On the gender front, the narrative highlights a more complex reality, where despite the cultural richness, women face a division of labor that often marginalizes their roles and contributions. The text calls attention to the need for addressing gender disparities within the context of environmental and societal well-being.

5. West Java

West Java presents a cautionary narrative, where the degradation of agricultural land, coupled with the overuse of fertilizers and pesticides, paints a picture of a threatened food system. The sustainability of these practices is under scrutiny, pointing to the need for more sustainable agricultural methods. Simultaneously, the province grapples with social issues where women, often the backbone of the agricultural sector, face exploitation, and societal norms that lead to early marriages and curtail their economic opportunities, suggesting a need for significant social reform.

6. East Nusa Tenggara

In contrast, East Nusa Tenggara sets an example of sustainable management of drylands and biodiversity, suggesting a model that could be replicated in similar environments. The region's approach to gender roles in environmental management is notably balanced, with men and women participating equally. This equitable participation not only enhances management but also ensures that conservation efforts are robust and inclusive, reflecting a society that values the contributions of all its members in the stewardship of natural resources.

Women in Economic Aspects

While maintaining a focus on women as a crucial variable in the analysis, the study delves into various economic aspects across different provinces, examining how these aspects interact with gender-related issues:

1. South Kalimantan

In South Kalimantan, women play a pivotal role in perpetuating cultural knowledge, teaching younger generations the valuable uses of plants and natural resources. Economically, the province seems to have a subsistence-based approach with limited commercial activities. Here, women's empowerment could be enhanced by expanding opportunities for them to commercialize their inherited knowledge, thus integrating traditional practices with economic development.

2. Papua

In Papua, there's a clear gender-based division of labor with men engaging in fishing and women in farming and gardening. Both activities are critical to the family's livelihood. Economically, the region depends on these primary sectors, but faces logistical challenges such as transportation costs and market access. Improving infrastructure and market integration could empower both men and women by enhancing the profitability of their respective economic activities.

3. West Nusa Tenggara

Women in West Nusa Tenggara are recognized as key health providers as midwives and healers. This points towards a respect for women's roles in healthcare, yet economic empowerment is tied to healthcare's socio-economic factors. Enhancing access to healthcare services and affordability could not only empower women but also provide broader economic benefits.

4. Bali

Bali's narrative underscores a gendered division of labor with an emphasis on women's marginalization. Economic opportunities for women in forest management are noted, suggesting that while women have roles in economic activities, these might be undervalued. Efforts to recognize and value women's work in forest management could lead to greater gender equality and economic empowerment.

5. West Java

The situation in West Java reflects more severe gender disparities, with women facing exploitation in agriculture, early marriages, and limited economic opportunities. Dependence on agriculture and vulnerability to failed harvests necessitates women's migration or marriage for additional income. Addressing these challenges requires systemic changes to create sustainable economic opportunities for women within the province.

6. East Nusa Tenggara

East Nusa Tenggara presents a more balanced scenario, with men and women participating equally in management. This balance is vital for the community's livelihood and resource provision. Promoting this balanced participation model could serve as an example for other regions to follow, potentially leading to enhanced community resilience and gender equality.

In conclusion, each province exhibits unique gender dynamics that influence economic aspects. Empowerment strategies need to be tailored to address specific cultural, economic, and social factors. Economic development efforts should be inclusive, recognizing and valuing the roles both genders play in traditional practices and modern economic activities. This approach can lead to sustainable development that promotes gender equality and lifts communities.

Women and Policy Implication

Looking deeper into the nuances and implications for policy development:

1. South Kalimantan

Serves as a model for the symbiotic relationship between indigenous knowledge and environmental stewardship. The people's expertise in ethnobotany and ethnoecology has evolved over generations, fostering a biodiversity that is both a biological and cultural treasure. Policy development here can transcend mere conservation, embedding indigenous practices into the fabric of environmental governance. By doing so, it not only safeguards biodiversity but also legitimizes and strengthens local knowledge systems. This integration could take the form of collaborative management plans for protected areas, community-led resource monitoring, and the establishment of ethnobotanical gardens to preserve and study traditional plant use.

2. Papua

Showcases the intrinsic value placed on environmental and social sustainability within local customs. The prohibition against environmentally harmful fishing and the communal pause on economic activity for a day reflect a deep-rooted recognition of the need for balance between human activity and nature. Policies shaped in this context should not impose modernization at the expense of these values but rather seek a complementary path. For instance, infrastructure projects could be designed with community consultation to mitigate impacts, and economic initiatives could be structured to promote sustainable practices, like

eco-tourism or sustainable fisheries, that provide livelihoods while respecting traditional customs.

3. West Nusa Tenggara

The traditional healing practices of Sasak midwives are not only a healthcare practice but also a cultural cornerstone. The intimate understanding these midwives have of local health needs and cultural contexts is invaluable. Mainstream healthcare policies can greatly benefit from integrating such indigenous knowledge, leading to healthcare services that are not only more culturally appropriate but also more widely accepted by the community. This could involve formal recognition and training for traditional healers, integration of traditional practices in local clinics, and research collaborations to bridge traditional and biomedical approaches.

4. Bali's

Cultural landscape is marked by a complex interplay of gender and tradition. Traditional norms here have historically shaped women's roles in society, sometimes limiting their public participation. By advocating for policies that encourage women's involvement in forestry, the region can challenge and reshape these norms to promote gender equality while also capitalizing on women's unique contributions to natural resource management. Such policies could involve gender-sensitive land rights, forestry entrepreneurship training for women, and the inclusion of women in decision-making bodies related to environmental management.

5. West Java

Is characterized by social practices such as early marriage and the exploitation of women, which pose significant challenges to women's empowerment and the sustainable development of the region. To address these issues, multifaceted policies are needed that not only aim to improve agricultural and food systems but also strive to uplift the status of women within society. These policies could include educational programs on gender equality, support for women's cooperatives in agriculture, and health initiatives targeting maternal and child welfare.

Finally, East Nusa Tenggara reflects a profound connection between local knowledge, values, and community life. This region highlights the potential for local knowledge systems to contribute significantly to regional development. Supportive policies from the local government, particularly in fostering Indigenous Knowledge and Skills (IKAS), could catalyze the empowerment of local communities. Such policies might include the establishment of cultural centers, the promotion of local crafts and industries in the global market, and the integration of traditional knowledge into the education system to preserve and perpetuate indigenous wisdom.

Managerial Implication

The managerial implications from the described research on Indonesian research articles and the role of women in sustainability and environmental impact are multifaceted and can inform strategic decision-making in various sectors. Here are some key implications:

1. **Research and Development Focus:** The fluctuating trend in the volume of research publications over the years suggests a need for more consistent and focused research efforts. Academic, practitioners, and research institutions should consider investing in long-term research projects, especially in underrepresented areas, to maintain a steady flow of scholarly work.
2. **Empowering Women in Sustainability:** The significant role of women in environmental sustainability highlighted in the study suggests that organizations and governments should focus on empowering women. This can be achieved through educational programs, community engagement initiatives, and policies that promote gender equality in environmental decision-making.

3. **Policy Development and Integration:** The study indicates a strong link between traditional knowledge and sustainable practices. Managers in government and policy-making bodies should consider integrating indigenous practices and women's knowledge into environmental governance and policy development.
4. **Economic Development and Gender Roles:** The economic aspects highlighted in the study suggest that women's roles in various provinces are crucial for economic sustainability. Managers in the private sector and government should create economic opportunities that recognize and value women's contributions, potentially leading to greater gender equality and economic development.
5. **Addressing Regional Challenges:** Each province faces unique challenges, such as exploitation of women in West Java and gender disparities in Bali. Managers and policymakers should tailor their strategies to address these specific regional issues, implementing targeted interventions for social reform and gender equality.
6. **Promoting Sustainable Practices:** The study's focus on the environmental impact underscores the need for sustainable practices in business and governance. Managers should consider adopting and promoting environmentally friendly practices in their operations and strategies.
7. **Cultural Sensitivity and Inclusivity:** The diverse cultural contexts across provinces call for culturally sensitive and inclusive approaches. Managers should ensure that their strategies and policies are aligned with local customs and traditions while promoting inclusivity and respect for diverse perspectives.
8. **Data-Driven Decision Making:** The need for more gender-specific data and comprehensive documentation of women's roles in sustainability suggests that managers should invest in data collection and analysis to make informed decisions.
9. **Holistic Approach to Sustainability:** Finally, a holistic approach to sustainability that includes environmental, economic, and social aspects, particularly gender equity, is crucial. Managers should adopt strategies that encompass these dimensions to ensure effective and equitable sustainability efforts.

Thus, the research highlights the importance of geographic diversity, women's empowerment, cultural sensitivity, and holistic approaches in managing sustainability and environmental impact. Adopting these insights can lead to more effective and inclusive strategies in various sectors.

Limitation of Study

While women's contributions to sustainability and environmental management are recognized in certain areas, there's a gap in the comprehensive documentation and discussion of these roles across the board. The limited explicit mention of women's roles may imply several things:

1. **Underrepresentation in Research:** Women's contributions to sustainability might be underrepresented or not adequately documented in scientific and policy-oriented research. This lack of visibility can lead to the undervaluation of women's work and knowledge in these fields.
2. **Need for Gender-Specific Data:** There is a necessity for more gender-specific data to understand the full scope of how women contribute to environmental practices and the obstacles they face. Gender-disaggregated data is crucial for creating targeted policies that address specific needs and challenges.
3. **Recognition of Women's Knowledge:** Women often possess unique knowledge about biodiversity and natural resource management, which can be integral to conservation efforts. Recognizing and documenting this knowledge can bolster sustainability initiatives.
4. **Cultural and Social Dynamics:** The roles women play in environmental sustainability are often shaped by cultural and social dynamics. A more in-depth discussion of these roles

could reveal insights into how traditional and societal structures support or hinder environmental efforts.

5. Empowerment and Policy Impact: Discussing women's roles in sustainability is not just about recognizing their contributions; it's also about empowering them to participate fully in environmental decision-making. Policies that do not take into account the roles and insights of women may be less effective.
6. Holistic Approach to Sustainability: A comprehensive approach to sustainability includes not only environmental and economic factors but also social aspects, such as gender equity. By paying more attention to the roles of women, a more holistic and thus more effective approach to sustainability can be developed.

The explicit mention of women's roles in sustainability and environmental impact is crucial for a complete understanding of how communities interact with their environment. Increasing the focus on women's roles can lead to more effective policies that take into account the contributions of all members of society, ensuring that sustainability efforts are robust, inclusive, and equitable.

In summary, the study presents a comprehensive overview of diverse ecological practices and knowledge across various Indonesian regions. Each region exhibits unique traditions and challenges, reflecting the deep connection between indigenous communities and their environment. The findings underscore the importance of preserving traditional knowledge and integrating it into modern practices and policies for sustainable development and conservation. The studies also highlight the need for legal and policy support to protect these practices and the livelihoods of indigenous communities.

CONCLUSION

Based on the extensive analysis presented, several key conclusions can be drawn regarding the role of women in sustainability and environmental impact across diverse Indonesian regions: first, variability in Research Output: The analysis of scholarly articles indicates a fluctuating trend in research publication volume over an eight-year period. While this demonstrates some level of scholarly interest, there is a need for more consistent and focused research efforts, particularly in underrepresented areas. Second, geographic Diversity and Gender Dynamics: Each province exhibits unique gender dynamics that influence economic aspects and environmental practices. Empowerment strategies should be tailored to address specific cultural, economic, and social factors prevalent in each region.

Third, women's Roles in Environmental Conservation: Despite being underrepresented in research, women play significant roles in environmental conservation and sustainability across various provinces. Their contributions encompass traditional knowledge transmission, economic activities, and cultural preservation. Four, Integration of Indigenous Knowledge: Indigenous knowledge systems, particularly those held by women, are integral to sustainable environmental management. Policies should prioritize the integration of indigenous practices into environmental governance to safeguard biodiversity and strengthen local communities. Five, Economic Empowerment and Gender Equality: Economic development efforts should recognize and value the roles of both genders in traditional practices and modern economic activities. Policies promoting gender equality in decision-making and economic opportunities can lead to sustainable development and community upliftment.

Six, Cultural Sensitivity and Inclusivity: Strategies and policies should be culturally sensitive and inclusive, respecting local customs and traditions while promoting gender

equality and diverse perspectives. This approach fosters community resilience and ensures effective and equitable sustainability efforts. Seven, Need for Gender-Specific Data and Recognition: There is a need for more gender-specific data and comprehensive documentation of women's roles in sustainability. Recognizing and valuing women's knowledge and contributions can lead to more effective policies and empowerment initiatives. Eight, Holistic Approach to Sustainability: Sustainability efforts should adopt a holistic approach encompassing environmental, economic, and social dimensions, with a focus on gender equity. Integrating women's perspectives and expertise enhances the effectiveness and inclusivity of sustainability strategies. In summary, the study underscores the importance of recognizing and empowering women in sustainability and environmental management. By integrating indigenous knowledge, promoting gender equality, and adopting a holistic approach, Indonesia can pave the way for more effective and inclusive sustainability efforts that benefit both people and the planet.

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