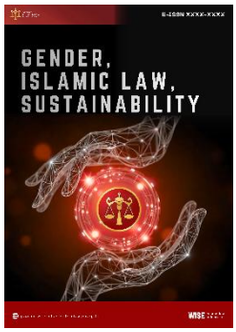

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Research Article

Implementation of the Sustainable Development Goals (SDGs) in the Education and Environmental Sectors: A Comparative Study of Indonesia and Australia

Evi Febriani[1]*, Ross Woods[2] , Ahmad Madkur[3], and Uswatun Hasanah[4]

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Abstract

The implementation of the Sustainable Development Goals (SDGs) requires an integrated understanding of how education and environmental governance interact to support sustainable development. Although previous studies have discussed SDG implementation in education or environmental policy separately, limited attention has been given to comparative analyses that connect SDG 4, SDG 13, and SDG 15 within a unified policy framework across countries. This study aims to analyze how Indonesia and Australia implement SDGs in the education and environmental sectors and to identify complementary policy models for sustainability governance. This research employed a qualitative juridical-comparative approach through policy analysis. Data were collected from national regulations, curriculum documents, SDG implementation policies, environmental legislation, and scholarly literature related to Indonesia and Australia. The data were analyzed thematically by comparing regulatory frameworks, educational strategies, environmental governance models, and implementation challenges. The findings show that Indonesia emphasizes sustainability through character education, local wisdom, community participation, and environmentally oriented school programs, supported by national education and environmental laws. In contrast, Australia applies a more science-based and regulatory approach through sustainability as a cross-curriculum priority, biodiversity protection, climate legislation, and evidence-based environmental management. These findings indicate that Indonesia's value-based and community-oriented model and Australia's scientific-regulatory model offer complementary strengths. The study suggests that effective SDG implementation requires stronger integration between sustainability education, ecological behavior formation, and environmental policy enforcement. However, the study is limited to document-based policy analysis, making further empirical research necessary to examine implementation outcomes at institutional and community levels.

Keywords: Australia; Environmental Policy; Indonesia; SDGs; Sustainable Education

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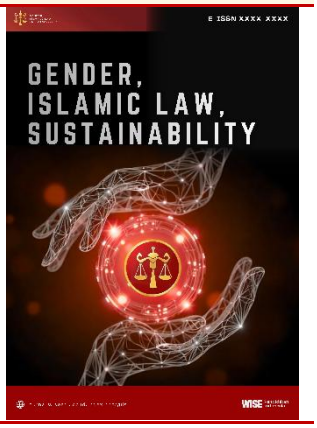

INTRODUCTION

The global agenda of the United Nations through the Sustainable Development Goals (SDGs) framework marks a shift in the development paradigm from an approach focused solely on economic growth toward sustainable development that balances social, economic, and environmental dimensions [1]. Since their adoption in 2015, the SDGs have served as a global roadmap to ensure human well-being while safeguarding planetary sustainability through 2030 [2]. This agenda emphasizes the interconnectedness of goals, meaning that the success of one goal is strongly influenced by the achievement of others. In this context, education and the environment emerge as two strategic sectors that reinforce one another in achieving sustainable development.

One of the SDGs is Sustainable Development Goal 4 (SDG 4), which focuses on providing quality, inclusive, and equitable education and promoting lifelong learning opportunities [3]. SDG 4 emphasizes not only access to education but also learning quality, equity, skills relevance, and the formation of responsible global citizens. Education is viewed as a catalyst for development because it enhances individual capacity, reduces social inequality, and encourages innovation and public participation in sustainable development [4], [5], [6]. Environmental sustainability issues are addressed through Sustainable Development Goal 13 (Climate Action) and Sustainable Development Goal 15 (Life on Land) [7]. SDG 13 calls for urgent action to combat climate change and its impacts [5], [6], [8], while SDG 15 focuses on protecting terrestrial ecosystems, conserving biodiversity, and preventing land degradation.

Climate change, deforestation, soil degradation, and biodiversity loss constitute global threats that directly affect food security, public health, and economic stability. Integrating environmental policy with education is essential for fostering ecological awareness and sustainable behavior at both individual and institutional levels. The relationship between education and environmental sustainability is increasingly recognized in academic literature and global policy. Environmental education and climate change education have rapidly developed as transformational strategies for addressing ecological crises.

In the Asia-Pacific region, Indonesia and Australia both demonstrate strong commitment to SDG implementation, particularly in education and environmental sectors. However, differences in geographic characteristics, levels of economic development, education systems, and environmental governance have resulted in differing policy approaches to achieving sustainable development goals.

Indonesia, as an archipelago nation with one of the world's richest biodiversities and a large population, faces complex challenges in environmental management and equitable education access. National commitment to the SDGs is affirmed through Presidential Regulation No. 59 of 2017 concerning the Implementation of Sustainable Development Goals Achievement [9], [10], [11]. This regulation emphasizes the integration of SDG targets into national and regional development policies through a multi-stakeholder approach.

In the environmental sector, Law No. 32 of 2009 on Environmental Protection and Management serves as the primary legal foundation for ecosystem protection and sustainable natural resource management, aligning with SDG 13 and SDG 15 targets. Meanwhile, the integration of sustainability values in education has been strengthened through national curriculum reforms, including contextual and project-based learning approaches in the Merdeka Curriculum, which opens opportunities to integrate SDG values into the learning process. Previous studies indicate that

this approach is effective in fostering sustainability awareness through experiential learning and real-world problem solving [12], [13].

In contrast, Australia is a developed country with well-established environmental governance and strong integration of sustainability within national education policy [14]. The implementation of sustainability education in Australia is reflected in the national curriculum through a sustainability cross-curriculum priority, ensuring that sustainability issues are taught across subjects [15]. Studies in international journals show that this cross-curricular approach effectively builds students' ecological competencies and promotes sustainable practices within school environments [16], [17].

In environmental policy, Australia has a comprehensive legal framework, including the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act), which regulates biodiversity and ecosystem protection [18]. In addition, national policies on climate change and land conservation emphasize science-based approaches, risk management, and community-based conservation [19]. This approach reflects a modern environmental governance paradigm that integrates scientific knowledge, public participation, and public policy.

Several previous studies indicate that Australia is committed to achieving Sustainable Development Goal (SDG) 4, which aims to ensure inclusive and equitable quality education and promote lifelong learning opportunities for all by 2030 [20]. Studies on Indonesia highlight the existence of educational disparities between urban and rural areas. These disparities include differences in educational facilities, teacher quality, family economic conditions, as well as access to technology and higher education. Australia and Indonesia have developed bilateral collaboration in the fields of education and environmental sustainability. International cooperation programs in education and the integration of environmental awareness demonstrate the importance of global partnerships in supporting the achievement of the Sustainable Development Goals (SDGs), including improving the quality of inclusive education and strengthening ecological awareness within society [21], [22], [23].

Although numerous studies have examined education, the environment, and the implementation of the SDGs, comparative research that simultaneously connects these two sectors between Indonesia and Australia remains limited. Some studies focus solely on sustainable education [24], while others emphasize environmental governance or climate policy [25]. Consequently, an gap exists in understanding how the integration of education and environmental policies contributes to achieving the SDGs in a holistic manner.

The novelty of this research lies in its integrative approach, linking the implementation of SDG 4 with SDG 13 and SDG 15 within a single framework of education and environmental policy analysis. This study does not examine education and the environment separately; instead, it positions education as a catalyst for ecological behavioral change and for enhancing the effectiveness of environmental policies. Through a comparison between Indonesia and Australia, this research reveals strategic differences between community- and local value–based approaches and science-based governance, while offering a policy integration model relevant to accelerating SDG achievement in the Asia-Pacific region.

METHODS

This study employs a qualitative approach with a comparative study design to analyze the implementation of the Sustainable Development Goals (SDGs) in the fields of education and the environment in Indonesia and Australia. A normative-empirical approach is used to examine the regulatory framework alongside its implementation practices in supporting SDG 4 (Quality Education), SDG 13 (Climate Action), and SDG 15 (Life on Land). This comparative study aims to identify similarities, differences, and best practices in integrating education policy and environmental governance.

Primary legal materials include key regulations from both countries. In Indonesia, the analysis covers Presidential Regulation No. 59 of 2017 concerning the Implementation of Sustainable Development Goals Achievement, Law No. 32 of 2009 on Environmental Protection and Management, and Law No. 20 of 2003 on the National Education System, as well as national development policies (RPJMN) and education curriculum policies. In Australia, legal materials include the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act), national climate change policies [26] and climate adaptation strategies, as well as the Australian Education Act 2013 and the Australian Curriculum, which incorporates sustainability as a cross-curriculum priority. Secondary materials are drawn from internationally reputable Scopus-indexed journal articles, government policy reports, and United Nations documents related to SDG implementation.

Data collection was conducted through literature review and policy documentation [27], by inventorying regulations, SDG implementation reports and academic studies related to sustainable education and environmental governance. Data analysis was carried out through normative analysis of the legal framework, comparative analysis of policies and implementation strategies, and thematic analysis to identify patterns of integration between education and the environment, challenges, and success factors. Research validity was ensured through source triangulation by comparing official regulations, policy reports, and academic findings, resulting in a comprehensive synthesis of best practices and opportunities for strengthening sustainable policy.

RESULTS AND DISCUSSION

The Concepts of SDGs in Education and Environment

The concept of the Sustainable Development Goals (SDGs) positions education and the environment as two interrelated pillars in achieving sustainable development. This global agenda, initiated by the United Nations, emphasizes that sustainability cannot be achieved solely through economic growth; rather, it requires a transformation of values, behaviors, and environmental governance toward long-term sustainability [28]. SDG 4 on quality education serves as a strategic instrument for fostering global awareness, social responsibility, and the capacity of societies to respond effectively to environmental challenges [4].

Sustainable education is no longer confined to academic literacy and workforce skills; rather, it encompasses the strengthening of sustainability values, environmental ethics, responsible consumption patterns, and the capacity to understand the interconnections among social, economic, and ecological systems. Through the Education for Sustainable Development (ESD) approach, education is directed toward equipping learners with environmental literacy, critical thinking skills,

and problem-solving abilities, enabling them to participate actively in safeguarding environmental sustainability and social well-being.

SDG 13 (Climate Action) and SDG 15 (Life on Land) emphasize the urgency of ecosystem protection and climate change mitigation as prerequisites for the sustainability of human life. Climate change, land degradation, deforestation, and biodiversity loss constitute global challenges that directly affect food security, public health, economic stability, and social resilience. Climate mitigation and adaptation efforts require technological innovation, effective public policy, and behavioral change rooted in ecological awareness [29]. Education plays a role in enhancing climate literacy and strengthening awareness of disaster risks [30]. Environmental education also reinforces awareness of biodiversity conservation, forest preservation, and sustainable natural resource management as part of humanity's collective responsibility toward the planet [31].

The integration of education and environmental policy constitutes a transformational strategy for building sustainable societies. Education fosters environmental awareness and pro-environmental behavior, while environmental policy provides the regulatory framework necessary to ensure that sustainability practices are implemented systematically. Their synergy can be realized through sustainability-oriented curricula, contextual learning that connects theory with conservation practices, the implementation of green schools and campuses, and community engagement in local environmental management. This integrative approach encourages a transition from awareness to concrete action, enabling societies to understand the importance of sustainability and to participate actively in its realization.

Implementation of SDGs in Education and Environment in Indonesia

The implementation of the Sustainable Development Goals (SDGs) in Indonesia represents a development paradigm that places the integration of human development and environmental protection at the core of national progress. As a megabiodiverse country facing complex ecological challenges including deforestation, peatland degradation, pollution, and vulnerability to climate change, Indonesia has adopted a sustainable development strategy that combines educational policy, environmental regulation, and community participation [32], [33].

National commitment to the SDGs has been institutionalized through Presidential Regulation No. 59 of 2017 on the Implementation of Sustainable Development Goals, which integrates global targets into national and regional development planning through a multi-stakeholder governance approach [33]. This institutional framework underscores that sustainability is not merely a sectoral agenda but a cross-sectoral and multi-actor national development paradigm. Within the education sector, sustainable development principles are embedded in the national education system as part of achieving SDG 4 (Quality Education).

The normative foundation is articulated in Law No. 20 of 2003 on the National Education System, which affirms that education aims to develop learners into individuals who are faithful, morally grounded, capable, creative, independent, and responsible citizens [34]. This normative framework is reinforced through national curriculum policies, including the 2013 Curriculum and the *Kurikulum Merdeka*, both of which emphasize character education, environmental literacy, social awareness, and contextual experiential learning [35]. This curricular transformation reflects a shift from knowledge transmission toward transformative learning that cultivates ecological competence and social responsibility.

The integration of sustainability education into the curriculum contributes to improved ecological literacy and the development of pro-environmental attitudes among students. Project-

based learning and experiential approaches have proven effective in fostering ecological awareness and social responsibility by enabling learners to engage directly with environmental realities. In this context, sustainability education extends beyond cognitive learning to encompass the formation of values, attitudes, and sustainable behaviors [36]. One significant innovation in environmental education in Indonesia is the Adiwiyata [37].

This program encourages schools to cultivate environmentally friendly cultures through integrated waste management, energy conservation, greening initiatives, and sustainable water management. Schools implementing the program demonstrate increased ecological awareness among students, behavioral shifts toward environmentally responsible practices, and the emergence of institutional cultures oriented toward sustainability [38]. Beyond formal education, religious values and local wisdom play a significant role in shaping environmental ethics. In Indonesia's religious and culturally rooted society, religious teachings and local traditions provide moral legitimacy for environmental stewardship. The integration of spiritual and cultural values into environmental education strengthens ethical responsibility toward nature and promotes ecological awareness grounded in collective morality. This approach reflects a values-based educational model that emphasizes not only scientific rationality but also ethical and spiritual responsibility for sustaining life.

At the level of environmental policy, Indonesia's legal framework for environmental protection is governed by Law No. 32 of 2009 on Environmental Protection and Management, which affirms principles of sustainable development, environmental harm prevention, and shared responsibility among the state, the private sector, and society in safeguarding ecosystems [39]. This law is reinforced by derivative regulations and policies, including greenhouse gas emission reduction strategies, rehabilitation of degraded forests and lands, and peatland ecosystem restoration. The government has also implemented forest and land rehabilitation programs, peat and mangrove restoration initiatives, and forest fire control measures as part of its climate change mitigation commitments. In the energy sector, national policies promote a transition toward renewable energy to reduce carbon emissions and dependence on fossil fuels.

The effectiveness of environmental policy is strongly influenced by multi-actor governance and community engagement. Community-based approaches, including community-based forest management, have proven effective in preserving forest ecosystems while improving local livelihoods [39], [40]. Recognition of Indigenous peoples' rights in forest governance strengthens conservation rooted in traditional knowledge and enhances the legitimacy of environmental policy [41], [42]. Customary natural resource management practices such as forest conservation, sustainable land use, and traditional zoning systems demonstrate that local cultural values can significantly contribute to ecosystem protection and resource sustainability [43], [44].

Implementation of SDGs in Education and Environment in Australia

Australia is a developed nation in the Asia–Pacific region that demonstrates a strong commitment to the implementation of the Sustainable Development Goals (SDGs), particularly through the integration of sustainability education and science-based environmental governance [45]. Australia's approach emphasizes strengthening human capacity through sustainability education while protecting ecosystems through stringent environmental regulations and evidence-based policymaking [46]. This integration supports the systematic and measurable achievement of SDG 4 (Quality Education), SDG 13 (Climate Action), and SDG 15 (Life on Land).

Australia integrates sustainability education comprehensively through the Australian Curriculum, which designates sustainability as a cross-curriculum priority. This approach ensures that sustainability issues are not taught as a standalone subject but are embedded across disciplines such as science, geography, economics, and civics. The policy is supported by the Australian Education Act 2013, which emphasizes the improvement of educational quality and the development of responsible and sustainability-oriented citizens [47].

The cross-curricular approach implemented in Australia has proven effective in enhancing environmental literacy and students' systems-thinking abilities. Sustainability education emphasizes understanding the relationships among human activity, economic systems, and ecological sustainability. Inquiry-based learning and problem-solving models encourage learners to engage with environmental issues critically and practically. Beyond the school level, universities play a significant role in SDG implementation through sustainability research, green technology innovation, and sustainable campus policies. Many higher education institutions implement green campus practices, including energy efficiency measures, carbon emission reduction, sustainable waste management, and water conservation.

Australia is recognized for its science-based environmental governance system, strong regulatory framework, and integrated ecosystem management. The primary legal framework for environmental protection is the Environment Protection and Biodiversity Conservation Act (EPBC Act), which serves as the national instrument for protecting biodiversity, critical ecosystems, and natural heritage [48]. The Act establishes environmental impact assessment mechanisms and protections for threatened species and habitats.

Australia's conservation efforts focus on safeguarding unique ecosystems and globally significant biodiversity. One of the most prominent examples is the protection of the Great Barrier Reef, the world's largest coral reef ecosystem, which plays a crucial role in marine ecological stability and the tourism economy [49]. Coral reef conservation policies include pollution control, sustainable fisheries management, and adaptation strategies addressing coral bleaching caused by climate change [50]. Australia has also advanced clean energy policies and a transition toward a low-carbon economy as part of its climate mitigation commitments. National energy policy promotes investment in renewable energy sources such as solar and wind power, making Australia one of the countries with the highest rates of household solar energy adoption in the world [51], [52].

Water management is another major focus of Australia's environmental policy, given the country's vulnerability to drought. Efficient, conservation-based water management systems are implemented through strict water allocation policies and water-saving irrigation technologies. This approach has proven effective in maintaining water security in arid and semi-arid regions. Australia has also developed climate change adaptation strategies to address bushfires, extreme heatwaves, and prolonged droughts. National adaptation policies emphasize science-based disaster risk management, early warning systems, and climate-resilient spatial planning.

Discussion

The findings of this study indicate that the implementation of the Sustainable Development Goals (SDGs) in education and environmental sectors in Indonesia and Australia reflects two different but complementary policy orientations. Indonesia tends to emphasize a value-based, community-oriented, and culturally rooted approach, whereas Australia demonstrates a stronger science-based, regulatory, and evidence-driven model of sustainability governance. This distinction shows that

SDG implementation is not a uniform process; rather, it is shaped by each country's socio-cultural structure, legal tradition, institutional capacity, and ecological challenges. The Indonesian model places education as a medium for cultivating ecological awareness through character education, local wisdom, religious values, and community participation. In contrast, the Australian model positions education and environmental regulation within a more systematic framework supported by national curriculum integration, scientific literacy, environmental impact assessment, and technological innovation. These findings support the view that sustainable development requires not only economic and policy instruments but also transformation in values, behavior, and governance systems [28].

The finding that education functions as a catalyst for sustainability awareness is consistent with previous studies emphasizing the central role of SDG 4 in strengthening ecological literacy, social responsibility, and citizens' capacity to respond to environmental crises [28]. This study confirms that education cannot be separated from climate action and ecosystem protection because environmental problems require long-term behavioral transformation. In Indonesia, sustainability education is embedded through character education, environmental literacy, and contextual learning within the national curriculum. This aligns with studies showing that project-based and experiential learning can promote students' ecological awareness by connecting classroom learning with real environmental problems [34]. However, this study extends previous findings by demonstrating that sustainability education becomes more effective when it is supported by environmental governance and community participation. Thus, the contribution of education lies not only in increasing knowledge but also in shaping ecological ethics and encouraging collective responsibility for sustainability.

The Indonesian findings also correspond with studies on school-based environmental programs, particularly the Adiwiyata program, which has been shown to foster environmentally friendly school cultures through waste management, energy conservation, greening initiatives, and sustainable water management [34], [35]. The present study strengthens these findings by situating Adiwiyata within the broader SDG framework, especially SDG 4, SDG 13, and SDG 15. The program is not merely an extracurricular environmental activity but part of a broader sustainability governance strategy that connects education, institutional culture, and environmental behavior. Nevertheless, this study also shows that Indonesia's sustainability education still faces structural challenges, including disparities in educational quality, uneven implementation across regions, and weak coordination between educational and environmental institutions. Therefore, although Indonesia has strong normative and cultural foundations, its policy effectiveness depends on the consistency of implementation, monitoring, and cross-sector collaboration.

The role of community participation and local wisdom in Indonesia's environmental governance is another important finding of this study. Previous studies have shown that community-based forest management can contribute to ecosystem protection while improving local livelihoods [37], [38]. Other studies also indicate that the recognition of Indigenous peoples' rights and customary forest governance can strengthen biodiversity conservation through traditional knowledge, social trust, and community legitimacy [39], [40]. The present study confirms these arguments by showing that Indonesia's environmental governance is strengthened when legal frameworks are connected with local ecological practices. This finding is important because environmental policy is often ineffective when designed only as a top-down regulatory instrument. In the Indonesian context, conservation efforts are more socially legitimate when they involve local

communities, Indigenous knowledge, religious ethics, and culturally embedded environmental values. This suggests that SDG implementation in Indonesia requires a governance model that combines formal regulation with community-based ecological stewardship.

In contrast, the Australian findings are consistent with studies that highlight the country's systematic integration of sustainability education into the national curriculum as a cross-curriculum priority [42], [43], [44]. Unlike Indonesia's value-based approach, Australia emphasizes scientific competence, systems thinking, inquiry-based learning, and evidence-informed environmental literacy. This approach enables sustainability issues to be taught across disciplines such as science, geography, economics, technology, and civics rather than being limited to a single subject. The present study supports previous research showing that cross-curricular sustainability education can strengthen students' ability to understand the interdependence between human activities, economic systems, and ecological sustainability. However, this study also adds a comparative insight by showing that Australia's educational strength lies not only in curriculum design but also in its alignment with environmental regulation, climate policy, biodiversity conservation, and clean energy transition.

The findings on Australia's environmental governance also align with previous studies on science-based conservation, climate adaptation, and clean energy policy. Australia's reliance on the Environment Protection and Biodiversity Conservation Act, biodiversity protection, environmental impact assessment, Great Barrier Reef conservation, renewable energy expansion, and water management reflects a governance model grounded in scientific evidence and regulatory control [14], [25], [46], [47], [49]. This study confirms that Australia has a stronger technocratic capacity in producing measurable, data-driven, and adaptive environmental policies. Nevertheless, the findings also indicate that strong regulatory frameworks do not automatically guarantee full sustainability success. Australia still faces serious ecological challenges, including bushfires, drought, marine ecosystem degradation, coral bleaching, and political-economic tensions related to extractive industries and energy transition. Therefore, this study supports the argument that environmental governance requires not only legal and scientific instruments but also policy consistency, political commitment, and economic restructuring toward low-carbon development.

The comparative analysis reveals that Indonesia and Australia have different strengths and weaknesses in implementing SDGs in education and environmental sectors. Indonesia is strong in value internalization, cultural legitimacy, community participation, and local ecological wisdom, but faces challenges in enforcement, institutional coordination, educational inequality, and policy monitoring. Australia is strong in scientific literacy, regulatory governance, technological innovation, and evidence-based policymaking, but continues to face climate-related ecological pressures and political-economic dilemmas in transitioning toward sustainability. This comparison shows that neither model is entirely superior; rather, both offer complementary lessons. Indonesia can learn from Australia's science-based policy design, data-driven monitoring, and cross-curricular sustainability education, while Australia can learn from Indonesia's community-based conservation, cultural legitimacy, and value-oriented ecological education. The integration of these two approaches can provide a more adaptive framework for SDG implementation, especially in the Asia-Pacific region.

The novelty of this study lies in its integrative comparative framework that connects SDG 4, SDG 13, and SDG 15 through the relationship between education and environmental governance. Previous studies have often examined sustainable education, climate action, biodiversity

conservation, or environmental law separately. This study offers a different perspective by positioning education as a catalyst for ecological behavioral change and environmental policy as an enabling structure for sustainable practice. The novelty also lies in identifying two complementary models of SDG implementation: Indonesia's value- and community-based ecological education model and Australia's science- and regulation-based environmental governance model. By comparing these two models, this study contributes to the development of a hybrid sustainability framework that combines moral-cultural transformation, scientific literacy, legal regulation, and community participation.

The implications of this study are both theoretical and practical. Theoretically, the study contributes to the literature on Education for Sustainable Development and environmental governance by demonstrating that sustainability requires the integration of educational transformation and legal-policy instruments. Education builds awareness, values, and behavior, while regulation provides institutional structure, accountability, and enforcement. Practically, the findings suggest that policymakers should design SDG implementation strategies that are not sectoral but integrated across education, environment, climate policy, biodiversity protection, and community development. For Indonesia, strengthening SDG implementation requires improving policy coordination, expanding sustainability education across regions, enhancing teacher capacity, and integrating local wisdom with scientific environmental literacy. For Australia, the findings imply the need to strengthen the connection between scientific policy, public participation, and long-term political commitment to climate and biodiversity goals. For the wider Asia-Pacific region, the study suggests that sustainable development can be advanced through a hybrid model that combines cultural values, community engagement, science-based governance, and regulatory accountability.

Despite its contributions, this study has several limitations. First, the research is based primarily on legal, policy, and literature-based analysis, so it does not include direct interviews with policymakers, educators, environmental practitioners, or community actors in Indonesia and Australia. Second, the study compares only two countries, which limits the generalizability of the findings to other Asia-Pacific contexts with different political, ecological, and institutional conditions. Third, the analysis focuses on SDG 4, SDG 13, and SDG 15, while other relevant goals such as SDG 6 on clean water, SDG 7 on affordable and clean energy, SDG 11 on sustainable cities, and SDG 17 on partnerships are not examined in depth. Fourth, the study relies on available policy documents and previous academic studies, which may not fully capture the gap between policy design and actual implementation at the local level. Future studies should therefore employ field-based methods, include stakeholder interviews, use comparative empirical indicators, and expand the country cases to develop a more comprehensive understanding of SDG implementation across different governance systems.

CONCLUSION

This study concludes that the implementation of the Sustainable Development Goals (SDGs), particularly SDG 4, SDG 13, and SDG 15, in Indonesia and Australia reflects two distinct but complementary sustainability governance models. Indonesia demonstrates a value-based and community-oriented approach by integrating sustainability principles into education through character formation, local wisdom, religious values, environmental literacy, and school-based ecological programs such as Adiwiyata. This approach is strengthened by community participation

and customary ecological practices, which provide social legitimacy for environmental protection. However, Indonesia still faces challenges related to policy enforcement, regional disparities in educational quality, institutional coordination, and the consistency of environmental governance implementation. Australia, in contrast, applies a more systematic, science-based, and regulatory approach to SDG implementation. Sustainability is embedded as a cross-curriculum priority within the national education framework, while environmental governance is supported by strong legal instruments, scientific evidence, technological innovation, biodiversity protection, climate adaptation strategies, and renewable energy policies. This model enables more measurable and evidence-based decision-making in addressing environmental problems such as climate change, biodiversity loss, bushfires, drought, and marine ecosystem degradation. Nevertheless, Australia also faces policy challenges, particularly in balancing environmental protection with economic interests, energy transition, and long-term climate commitments. The novelty of this study lies in its integrative comparative framework that connects education and environmental governance as mutually reinforcing instruments for achieving sustainable development. Rather than examining SDG 4, SDG 13, and SDG 15 separately, this study shows that education can function as a catalyst for ecological behavioral change, while environmental policy provides the institutional and regulatory foundation for sustainable practice. The comparison between Indonesia and Australia highlights the potential of a hybrid sustainability model that combines Indonesia's cultural, ethical, and community-based strengths with Australia's scientific, regulatory, and technological capacities. The implication is that SDG implementation in the Asia-Pacific region requires not only formal policy commitment but also stronger integration among education, environmental regulation, community engagement, scientific literacy, and cross-sector governance. Future studies should expand this comparative analysis by involving more countries, incorporating field-based empirical data, and examining the direct impact of sustainability education and environmental policy on behavioral and institutional change.

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AUTHOR CONTRIBUTION

E.F. conceptualized the study, developed the main research framework, and formulated the comparative focus on SDG implementation in the education and environmental sectors in Indonesia and Australia. R.W. contributed to the refinement of the theoretical framework, strengthened the international policy perspective, and critically reviewed the manuscript for intellectual coherence and academic rigor. A.M. contributed to the methodological design, collected and organized legal, policy, curriculum, and environmental governance documents, and supported the comparative policy analysis. U.H. contributed to the literature review, thematic analysis, interpretation of findings, and refinement of the discussion on sustainable education and environmental governance. All authors contributed to manuscript drafting, critical revision, and final approval of the submitted version. All authors agree to be accountable for all aspects of the work.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

DECLARATION OF USE OF AI IN SCIENTIFIC WRITING

The authors used several generative AI tools in the process. ChatGPT was used to help organise complex concepts, while Grammarly was employed to enhance the grammar, style, readability of the text and improve the overall clarity of the writing. Although these tools provided valuable support, the researcher wrote all the content and conclusions.

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