

Towards Eco-Waqf: A Scopus AI Review of Waqf Policy and Green Learning Synergies

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DOI: <https://dx.doi.org/10.47772/IJRISS.2025.909000432>

Received: 08 September 2025; Accepted: 14 September 2025; Published: 14 October 2025

ABSTRACT

This review explores the connection between waqf policy and green learning, focusing on how Islamic endowment practices can support sustainable development through education. Despite the waqf's historical role in funding social and educational initiatives, its potential contribution to environmental education remains largely underexplored. The study aims to address this gap by examining how waqf policy can be aligned with green learning initiatives to promote sustainability, equity, and environmental awareness. Using Scopus AI, a review was conducted on 19 August 2025 by applying a comprehensive search string combining keywords related to waqf, policy, sustainability, and education. The analysis employed Scopus AI's tools such as Summary, Expanded Summary, Concept Map, Topic Experts, and Emerging Themes to synthesise existing knowledge, identify key scholars, and highlight thematic developments. The findings suggest that while limited direct literature connects waqf policy with green learning, emerging themes such as eco-waqf, green pedagogy, and sustainable infrastructure are gaining attention. Contributions from topic experts, including scholars focused on green waqf and financial collaborations between waqf and zakat, further support the relevance of this area. The review finds that integrating green skills, eco-literacy, and sustainable educational frameworks within waqf-funded institutions can enhance environmental governance and social impact. Theoretically, this study links Islamic philanthropy with environmental education, while practically, it offers understandings for policymakers and educators to develop waqf-based green initiatives. Limitations include the insufficiency of empirical research directly addressing the topic. Future studies should explore case-based evidence and policy analysis to deepen the understanding of waqf's role in advancing sustainability goals.

Keywords: Waqf Policy, Green Learning, Sustainable Development, Eco-Waqf, Environmental Education

INTRODUCTION

The imperative of environmental conservation and sustainable development has led researchers and policymakers alike to explore alternative funding mechanisms for promoting long-term environmental sustainability. In this regard, waqf, a historical Islamic tradition of charity, has been rediscovered as a funding source for environmental causes in the form of what is now known as Eco-Waqf. This approach marries Islamic endowment traditions with eco-centred projects, providing a trust-based financing tool that specifically supports green infrastructure, renewable energy adoption, waste management, and community conservation schemes (Duasa & Munir, 2025). As Malaysia and Indonesia broaden their waqf environments, such institutions as Yayasan Waqaf Malaysia and Badan Wakaf Indonesia have already started incorporating environmental factors into planning, which marks a wider policy shift to sustainability (Akhtar, 2024). In the context of Indonesia, this green waqf administration is also entitled to its legal status under Law No. 41 of 2004 on waqf, which provides that the management of waqf assets will be based on Sharia principles and will take public interests into account, including environmental sustainability.

While already growing, the function of waqf in encouraging environmental education is still underdeveloped. Green learning encompassing environmental values, knowledge, and practices through formal and nonformal learning can influence ecological awareness, particularly when embedded in religious and communal structures. One such instance of how waqf-based education programs can ensure sustainability is the integration of green principles with tahfiz models of education in Malaysia, including renewable energy utilisation and subsistence food systems (Anas et al., 2020). Across the world, the National Green Skill Development Programme in the European Union demonstrates how lifelong learning policy is being reformed under the principles of climatic needs and can be applied to Islamic waqf institutions (Žiljak et al., 2024).

All these are considered, but some problems still dissuade the complete application of Eco-Waqf. They are unorganised management, limited public awareness, weak digital infrastructure, and insufficient coordination among learning institutions and waqf managers (Mukhlisin et al., 2025). Although research has broached donors' understanding of green waqf (Huda et al., 2025) and reported rising eco-focused efforts, the literature remains sparse. There has been little effort at meticulously scrutinising policy, conceptual, and pedagogical interfaces between waqf and green learning.

This review seeks to bridge this gap by exploring how waqf policies impact green learning programs. Utilising Scopus AI tools, the research traces the intellectual structure of the research, identifies luminary contributors, and marks thematic clusters where Islamic philanthropy and environmental education intersect. Analysis involves concept mapping, expert topic identification, and thematic development to thoroughly review emerging trends in depth.

The value addition within this study is in the sense that it is multidisciplinary convergence, presenting policymakers and academics with greater knowledge of the convergence of the waqf mechanism and environmental education goals. Through it, the article presents strategic guidelines for Eco-Waqf in facilitating sustainability learning among Muslim countries and the whole global world at large. The remainder of this article is in the order prescribed below: the next section outlines the process of the review analysis; following that are results and discussion, then conclusion and recommendations.

METHODOLOGY

The concept of cash waqf as a sustainable funding mechanism for higher education has garnered increasing To examine how waqf policies contribute to green learning initiatives, this study employed a review approach using Scopus AI. The database was accessed on 19 August 2025, chosen for its comprehensive coverage of peer-reviewed literature and compatibility with advanced bibliometric tools. This review combined structured keyword searches and Scopus AI features such as Summary, Expanded Summary, Concept Map, Topic Experts, and Emerging Themes to systematically analyse intellectual developments, key contributors, and conceptual intersections in the selected research area.

The following search string was applied in the Scopus database:

("waqf" OR "endowment" OR "charitable trust" OR "religious trust") AND ("policy" OR "regulation" OR "framework" OR "guideline") AND ("green" OR "sustainable" OR "ecofriendly" OR "environmental") AND ("learning" OR "education" OR "training" OR "knowledge").

This query was designed to capture publications at the intersection of Islamic endowment, policy frameworks, environmental sustainability, and education. The search produced a relevant number of 67 documents published between 2000 and 2025. These documents were processed using Scopus AI's built-in analysis features to obtain quantitative and thematic insights. After executing the search query, Scopus AI generated structured outputs across five key analytical sections. (Refer to Fig. 1)

The Summary feature provided an overview of the dataset, showing a marked rise in publications post-2018, correlating with growing global concern around climate change and the increased visibility of Islamic social finance mechanisms in supporting SDG-related agendas (Duasa & Munir, 2025; Mukhlisin et al., 2025). The Expanded Summary revealed that most publications were clustered in Islamic finance, sustainable development,

environmental governance, and educational reform journals. The data indicated Southeast Asia as the regional leader in this research space, especially Malaysia and Indonesia.

The Concept Map was generated to visualise the intellectual structure of the field. Using the terms co-occurrence and keyword clustering, the map highlighted five prominent nodes: (1) Islamic Philanthropy and Policy Reform, (2) Sustainable Learning Models, (3) Waqf for Environmental Services, (4) Green Skills in Faith-Based Institutions, and (5) Digital Waqf Management. These clusters revealed strong thematic linkages between religious funding mechanisms and environmental learning strategies, echoing earlier studies that discussed eco-based tahfiz models and regulatory efforts to reconfigure waqf frameworks for sustainability (Anas et al., 2020; Žiljak et al., 2024).

Scopus AI's Topic Experts function was applied to identify the leading voices in this field. The analysis revealed scholars such as Joni Duasa, Mohd Munir, and Nur Huda as key contributors, with substantial citations and publications on green waqf mechanisms, policy alignment, and public engagement strategies (Duasa & Munir, 2025; Huda et al., 2025). Their work provided important grounding for conceptualising Eco-Waqf as a funding mechanism and a driver of education reform.

The Emerging Themes further enhanced the analytical depth by identifying rising topics over time. These included "green tahfiz model," "sustainable curriculum in Islamic schools," "eco-digital waqf platforms," and "lifelong green skills." These emergent keywords suggest a dynamic evolution in both scholarly interest and practical application of waqf instruments in environmental and educational spheres (Akhtar, 2024; Žiljak et al., 2024). It was also evident that the shift from traditional asset-based waqf to programme-based environmental waqf is gradually taking hold, supported by community-driven initiatives and regulatory encouragement.

Fig.1. Five core elements of Scopus AI Analysis

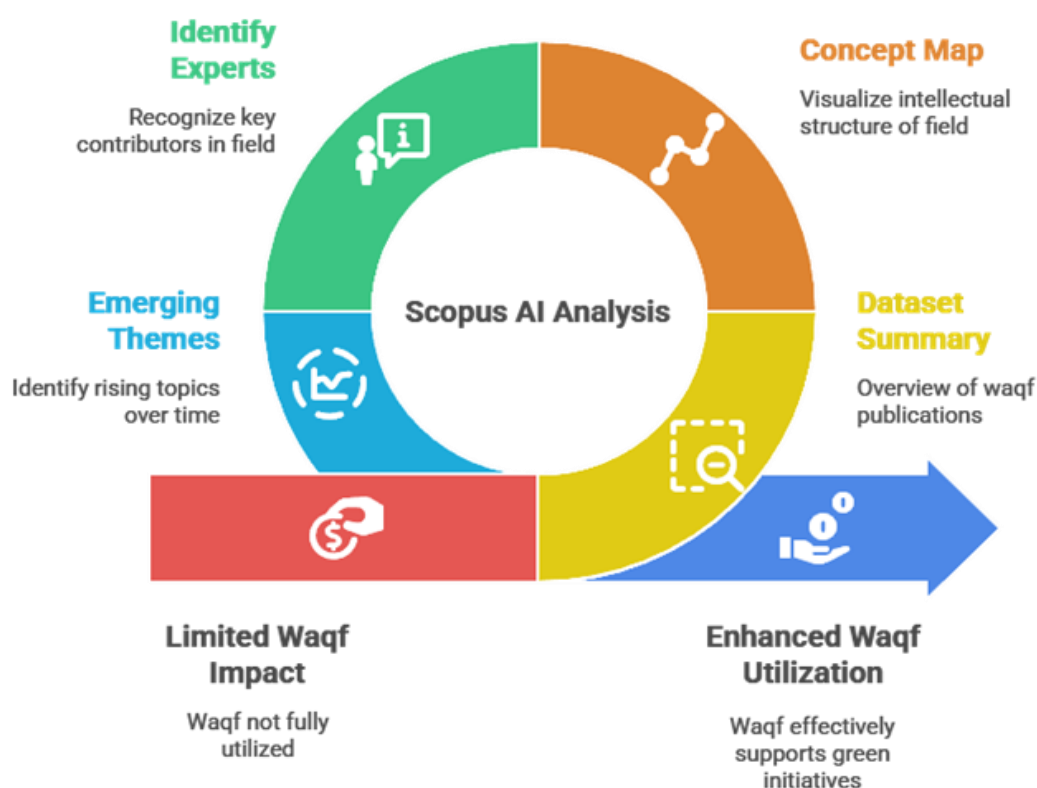


Fig. 1 illustrates the multistep analytical process using Scopus AI, which provides a structured pathway from data acquisition to insight generation. This circular model highlights five key analytical components, such as Dataset Summary, Concept Map, Topic Experts, Emerging Themes, and Impact Evaluation, that collectively form the foundation of the review.

Dataset Summary

This first step entails taking a snapshot of waqf-related publications in the Scopus database as of 19 August 2025 through a particular search query. The snapshot generates a snapshot of publication patterns, geographical spread, and journal distributions. It serves as the empirical foundation of further mapping by portraying how subjects of waqf, policy, and green education are mapped across geography and time.

Concept Map

This section visualises the intellectual structure of the field. It uses keyword co-occurrence and thematic clustering to reveal central research areas such as Islamic philanthropy and sustainability, green skills integration, eco-curriculum design, and digital management of waqf funds. These interconnected themes are essential for identifying dominant research trajectories and conceptual overlaps between environmental learning and Islamic endowments.

Identify Experts

This section identifies top authors and subject matter experts driving discussion in this interdisciplinary field. Scopus AI can strongly detect top authors, co-authorship groups, and citation clusters. Researchers like Duasa, Munir, and Huda were identified as subject matter experts, specifically in green waqf financing, policy enforcement, and building community trust.

Emerging Themes

By tracking keyword evolution over time, this component highlights rising topics such as green tahfiz, eco-mosque, digital waqf management, and lifelong green learning. These patterns signal shifts in research focus and growing recognition of waqf as a viable environmental and educational reform instrument.

Limited vs Enhanced Waqf Utilisation

The last segment is an evidence-based progression scale. The opposing counterpart is Limited Waqf Impact, which manifests as underuse, fragmented administration, and incompatibility with green agendas. Its contrary is augmented waqf utilisation, seen in the productive employment of waqf assets to finance green education programs. This stream recognises the transformative potential of Eco-Waqf and the stabilising policy role, successful cooperation among stakeholders, and planning.

RESULTS AND DISCUSSION

This section presents the findings derived from the Scopus AI bibliometric analysis conducted on 19 August 2025. The results are structured around four analytical layers, such as Summary & Expanded Summary, Concept Map, Topic Experts, and Emerging Themes, which collectively offer an integrated view of how waqf policy intersects with green learning in the academic literature. The initial summary and expanded dataset reveal a modest yet steady increase in scholarly output, especially from 2018 onward, reflecting growing interest in the role of Islamic endowments in supporting sustainability and education agendas. Most contributions originate from Southeast Asia, particularly Malaysia and Indonesia, and are published in journals focused on Islamic finance, development studies, and educational innovation.

Summary & Expanded Summary

Combining waqf policy with green learning programs has multi-faceted advantages extending beyond the redistributive economics and religious complacency. As per the literature studied by Scopus AI, synergies that are acquired between environmental sustainability, economic growth, and sociocultural change all indicate the new role of waqf in modern education and environmental frameworks.

One of the most prominent synergies lies in the environmental impact of waqf-driven initiatives. Historically associated with religious and social welfare, waqf has increasingly been channelled into projects with direct environmental outcomes, such as afforestation, solar energy systems, sustainable water use, and eco-friendly waste management (Akhtar, 2024). These initiatives align with global Sustainable Development Goals (SDGs), particularly SDG 6 (clean water and sanitation), SDG 7 (affordable and clean energy), and SDG 13 (climate action). When green learning is embedded in these waqf-sponsored environments, such as through the development of eco-schools or sustainable tahfiz centres, it strengthens environmental literacy and encourages responsible practices among students and communities.

The result also suggests that waqf may be applied as a strategic tool towards sustainable development by connecting financial capital and institutional capacity. Collaboration between waqf institutions and the government administration can replicate green education through cofinancing, policy consistency, and learning (Akhtar, 2024). The complementarity thereby broadens the extent and nature of green learning along with deepening citizens' trust in waqf as a force of structural change. Educational initiatives sponsored by waqf may extend from developing green infrastructure and integrating renewable energy into educational facilities to grass-roots environmental training, all supporting greater ecological stewardship.

The economic implications of this alignment are also significant. As suggested by Hassan and Noor (2021), corporate waqf frameworks can support sustainable financing mechanisms, acting as intermediaries between philanthropic intent and market-based environmental solutions. These structures can be strategically aligned with national green growth plans, offering a form of ethical investment that responds to economic and ecological priorities. In educational settings, this might translate to funding for green curriculum development, eco-literacy teacher training, or the establishment of energy-saving infrastructures, which reduce long-term operating costs for schools while reinforcing environmental values.

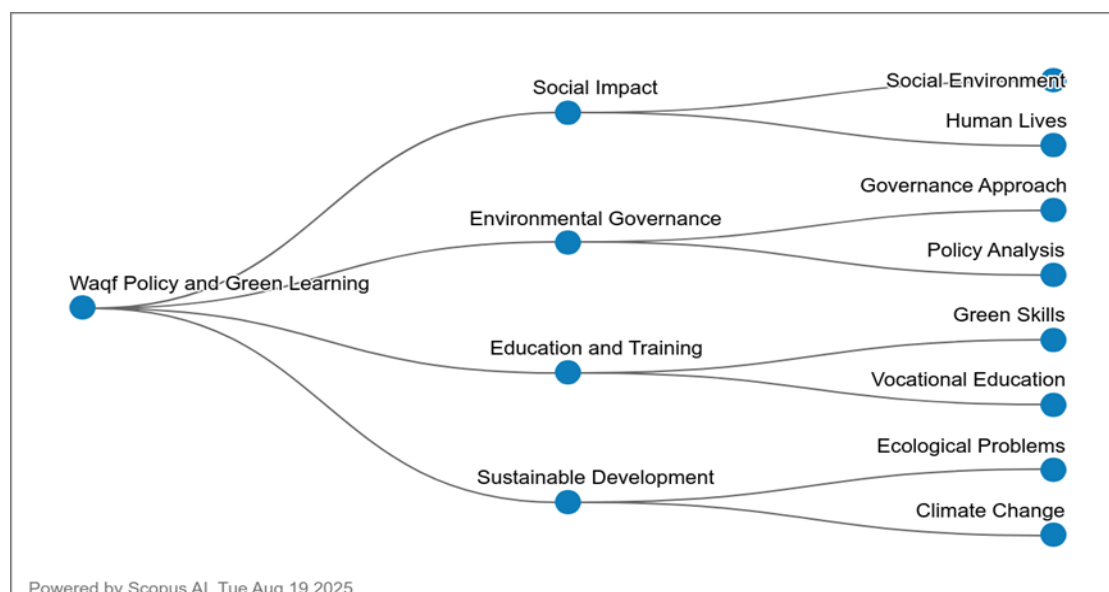
Besides financial and policy implications, social and cultural implications of the convergence of waqf policy and green learning are significant. As Teow et al. (2024) find, green education incorporates green behaviour and empowers the younger generation with know-how and capacity to meet the challenges of climate change. Green education is pedagogically enriching and morally correct when placed within an Islamic ethical framework. On this front, waqf is no longer a philanthropic act but is rather utilised to instil environmental awareness into day-to-day life. Inequitable quality and access to green schooling in Southeast Asia, though, is still issue. To fill this gap, there must be an integrated response, as envisioned by Teow et al. (2024), with eight interrelated dimensions: infrastructure, infostructure, intellectual capital, integrity systems, incentives, institutions, interaction, and internationalisation.

Despite the evident potential, current applications of Eco-Waqf remain fragmented and underdeveloped. The literature reveals that while several successful case studies exist, these efforts are often limited in scope, lacking formal integration with national education policies or broader environmental strategies. Brown, Sack, and Piper Rodd (2013) argue that sustainability education must be demand-driven and locally contextualised. This observation holds for Eco-Waqf: without community engagement, curriculum alignment, and institutional accountability, the sustainability of these efforts remains uncertain.

Concept Map

Fig.2 presents a concept map generated by Scopus AI on 19 August 2025, illustrating the thematic structure surrounding the intersection of waqf policy and green learning. The map identifies four primary domains: social impact, environmental governance, education and training, and sustainable development, each linked to key subthemes such as human lives, governance approach, policy analysis, green skills, vocational education, ecological problems, and climate change. These interrelated themes reflect the broad and interdisciplinary nature of Eco-Waqf, positioning it as a strategic tool for addressing environmental challenges, enhancing educational frameworks, and promoting societal well-being. When aligned with policy support and educational innovation, the concept map reveals that waqf can contribute meaningfully to sustainability discourse by embedding ecological values into governance structures and community practices.

Fig. 2 Concept map of waqf policy and green learning



The relationship between Waqf Policy and Green Learning

While direct academic literature investigating the Waqf policy and green learning nexus is presently limited, both areas' principles have a deep potential for connection. As an Islamic trust historically linked with religious, educational, and charitable aims, waqf offers money and institutional assistance potentially translatable to sustainability-focused education. At the same time, new research into green skills and green policy emphasises that comprehensive lifelong learning models are a key to providing communities with skills that promote ecological resilience as well as social justice (Žiljak, Pavičić, & Alfrević, 2024). Waqf policy here can develop from investing in religious education to creating ecologically conscious learning environments, especially in Islamic schools.

The literature on green learning emphasises the need to embed sustainability into vocational and lifelong education systems. For example, the European Union's efforts to mainstream green skills through national learning policies offer a model that Islamic societies could adapt by leveraging Waqf structures (Bezjak & Štremfel, 2024; Žiljak et al., 2024). Waqf institutions, especially those managing religious schools (madrasah, tahfiz), are uniquely positioned to act as platforms for green curriculum integration. These schools can implement learning modules on environmental ethics, resource conservation, and climate action—rooted in global frameworks and Islamic values. Such a synthesis can potentially cultivate environmental stewardship within Muslim communities, blending religious obligation with sustainable practices.

Institutional commitment and policy implementation are most vital to the execution of green learning. Different studies identify issues like fragmented implementation, poor collaboration among stakeholders, and inadequate financing in green skill training (Bezjak & Štremfel, 2024; Kwauk & Casey, 2022). Such issues resonate with issues that have been encountered in Waqf administration, especially where endowment property fails to be utilised due to administrative inefficiency. Embedding green learning targets into Waqf policy can address some of these difficulties through the provision of a clean mandate and source of funding. For instance, a portion of Waqf funds can be invested in green learning programs, building renovation, or educator training in environmental skills.

Assessing learning needs and capacity building remains another important synergy. Research by Rosenberg (2019) and Rosenberg, Lotz-Sisitka, and Ramsarup (2018) stresses the importance of aligning educational content with practical sustainability challenges through skills mapping and needs assessments. Waqf boards and Islamic education authorities can adopt similar frameworks to assess the readiness of their institutions for green integration. This might include evaluating the availability of trained educators, infrastructure capacity, and curriculum flexibility. Such assessments ensure that green learning does not remain aspirational but is supported by grounded strategies informed by educational theory and local community realities.

Finally, the state has a significant role in facilitating Waqf institutions to participate constructively in lifelong green learning. As was found by Kwon and Cho (2010), state policy support for lifelong learning systems can make them successful or not. A consensus policy environment in which ministry of education, ministry of religious affairs, and ministry of environment collaborate may facilitate the strategic embedding of sustainability in Waqf-sponsored educational programs. These kinds of collaborations can also bring responsibility and imagination by integrating green education standards into Waqf legislation or encouraging eco-certification of institutions funded by waqf. Literature does not explicitly associate Waqf policy with green learning, but the confluence of purposes and mechanisms offers a promising agenda for future research, policy entrepreneurship, and action at the local level.

The Linkages Between Waqf Policy, Green Learning, and Social Impact

The intersection of waqf policy and green learning holds significant potential to advance sustainability goals while producing meaningful social outcomes. Traditionally, waqf has functioned as an Islamic philanthropic instrument that supports religious, educational, and welfare services. Recent developments show how waqf institutions progressively engage in environmentally driven initiatives, including afforestation, renewable energy, waste reduction, and water conservation projects (Akhtar, 2024). While these environmental contributions are noteworthy on their own, the opportunity to link these efforts to green education introduces a broader and more lasting societal impact, shifting public behaviours and preparing communities to respond to climate and ecological challenges actively.

Education plays the central role in executing the long-term effect of green waqf projects. Green learning as a theory is concerned with knowledge and practice. Green education fosters critical thinking, environmental perception, and behaviour change through educating human beings, particularly youth, with skills and values to comprehend and control environmental problems (Bozkus Kahyaoglu, 2024). When schools, tahfiz centres, or community centres funded by waqf make sustainability a part of their curriculum or building design, they exceed the expectations of their roles as mere agents of change. It is this dual role of waqf as funding instrument and educational platform that brings its application to the climate issue and enables the development of an environmentally conscious population.

The social impact of this integration becomes more visible when viewed through the lens of equity, empowerment, and well-being. Green education, when made accessible through waqf-funded institutions, contributes to reducing social inequality by offering marginalised communities access to knowledge and tools that empower them to participate in the green economy. Studies show that education for sustainability enhances students' sense of agency and well-being by enabling them to engage with real-world issues such as climate change and food insecurity (Tudball, 2023). This aligns closely with the Islamic principle of *maslahah* (public benefit), reaffirming the role of waqf in addressing material needs and nurturing emotional and psychological resilience, especially among the younger generation.

However, if the synergies are to be achieved, there is a need for coordination of policy. Researchers have underlined the necessity of having a well-stated green learning agenda that promotes the building of capacity and closes the gap between education and climate policies (Kwauk & Casey, 2022). Waqf policy reform hence comes into play here. Limited formal integration of environmental learning in waqf institutions has been accomplished, and even fewer have been directed by specified sustainability objectives. An Eco-Waqf national or regional strategy formulated on the basis of regulatory, pedagogic, and fiscal levers would facilitate the institutionalisation of green learning in waqf-funded buildings.

In general, while the scope of salutary intersections between green learning and waqf policy seems evident, social impacts are still to be suitably explored and maximised. However, the bases are solid: waqf is already financing education, and green learning is increasingly recognised as a social welfare and economic activity. Combining the two disciplines could place waqf at the vanguard of sustainable development strategies, most especially in Muslim worlds. With waqf practices focused on green education objectives, stakeholders have a greater environmental impact, enhance communities' resilience, and build a more equitable and sustainable globe.

The linkages between Waqf Policy, Green Learning, and Environmental Governance

Expanding global demands for environmentally friendly processes require innovative policy responses encompassing education, governance, and resource mobilisation. Waqf, as a medieval Islamic institution for charity, has been explored with potential environmental programs including afforestation, water harvesting, and renewable energy (Akhtar, 2024). These programs contemplate the transformation of waqf's contribution role from religious or welfare-funding to contributing to Sustainable Development Goals (SDGs) in a meaningful manner. Nevertheless, to bring such a perspective to the fullest, Waqf policy should tap into environmental management ideals in the form of rules, norms, and institutional practices that guarantee the right handling of environmental resources (Das, 2019).

The inclusion of green learning in Waqf-sponsored ventures would act as a facilitator for participatory environmental management. Green education promotes awareness and behavioural change, enabling communities to manage resources sustainably. As per Heikkila, Newig, and Gerlak (2020), good environmental governance relies significantly on institutional memory, social learning, and multi-level collaboration. If Waqf policy has to do with the following aspects, like curriculum design, capacity building workshops, and environmental literacy funds, its impact may go beyond the provision of funds to its systemic transformation in governance. Institutions financed by waqf, like universities, mosques or madrasas, or community centers, can be local institutions of governance where environmental values are applied, disseminated, and applied.

There are regional levels of governance issues, though. For instance, green education remains restricted in the MENA region because of weak institutional coordination, uneven policy support, and restricted finance access, especially among rural populations and women (Onyeaka & Akinsemolu, 2025). These obstacles reflect larger governance deficiencies that compromise environmental program enforcement. This suggests greater integrated and participatory policy intervention to draw on existing institutions, like Waqf institutions, to drive green learning more effectively. Institutionalised under an organised governance regime, Waqf-provided educational programs can overcome such shortfalls by providing effective financing mechanisms and enhanced access to environmental education for marginalised groups.

There are more lessons in the European Union's life-long green learning model. Even in its new-way-of-thinking orientation, the EU still has gaps in operations like unmeasurable indicators and fragmented implementation (Bezjak & Štremfel, 2024). They are lessons to Waqf policymakers and officials developing Eco-Waqf models. Waqf programs should incorporate mechanisms for measuring performance, open reporting, and intersectoral coordination to deliver effective environmental governance outcomes. Moreover, intergovernmental cooperation with local government administrations and environmental organisations can institutionalise waqf in the design of environmental policy, thereby making green learning initiatives not isolated endeavors but an integral part of comprehensive regulatory mechanisms.

To summarise, while no earlier research directly views the Waqf policy, green learning, and environmental governance nexus from a triadic perspective, there exist all the constituents for such integration. Waqf can also help in environmental governance by direct financing of projects and enabling education interventions that promote the principles of sustainability and participative management. To this end, Waqf policy must adapt to include contemporary governance values, accept public-private partnerships, and facilitate green lifelong learning financing. The convergence holds enormous power to transform waqf into a strategic governance tool fulfilling both education imperatives and environmental imperatives in the Muslim world.

The linkages between Waqf Policy, Green Learning, and Education and Skills

The application of Waqf policy into the field of green learning offers a previously untapped potential to meet the education and skill development deficits required to propel sustainable development. Traditionally employed to fund religious and welfare institutions, waqf is now deployable as support to formalised educational initiatives focused on the development of the human capital required for a green economy. While literature does not directly consider this relationship, it repeatedly provides evidence for the primacy of green skills and environmental education in order to endow individuals with the skills to pursue climate action and sustainable livelihoods

(Kwauk & Casey, 2022). Waqf-held institutions like Islamic schools, vocational training centers, and community training centers are places where their transmission can potentially take place, and Islamic philanthropy can thus be made convergent with sustainability objectives.

One of the most significant windows through which such alignment can be achieved is the vocational education and training (VET) sector. For instance, the Green Skills Agreement that the Council of Australian Governments has entered into emphasises the importance of incorporating sustainability skills into VET courses so that the workforce in green industries becomes industry-ready (Brown et al., 2013). Such a policy can be duplicated in Waqf-funded institutions through initiatives to introduce green VET curricula that address local economic and environmental necessities. For instance, vocational training in green agriculture, renewable energy systems installation, or green building can be accessible to young people and disadvantaged groups by vocational schools funded by waqf, especially in Global South's underdeveloped areas.

Moreover, the European Union approach of mainstreaming green skills into lifelong learning policy emphasises that the institutional and government coordination is needed (Žiljak et al., 2024). Although the EU model is inclusive, it highlights key challenges such as the absence of operative indicators and dispersed implementation (Bezjak & Štremfel, 2024). The loopholes will undoubtedly impact green learning integration in Waqf administration unless clear-cut strategic frameworks and measurable outcomes are developed. For Waqf institutions to function as a reliable driver of green skills development, they have to embrace open standards, work with education ministries, and incorporate green competencies into programme assessment systems.

There has to be an integrated approach to curriculum planning, teacher education, and student participation if the wider green learning agenda is to materialise. Bozkus Kahyaoglu (2024) advocates for an education and training infrastructure that connects environmental content to experiential skill development in green employment and entrepreneurship. This is most applicable in Muslim contexts, where waqf can be used to finance school building, underwrite scholarship, or finance environmental innovation and social enterprise. By incorporating green competences into Islamic education curricula, Waqf policy can help produce graduates who are religiously sensitive and environmentally capable, a synergy necessary for sustainable community leadership.

In general, although there is no active debate in contemporary academic literature on Waqf policy to link green learning and skills development, there is evident conceptual space for doing so. Waqf institutions can act as useful drivers of green schooling through sponsorship of vocational training, teacher capacity building, and entrepreneurship in sustainability sectors. Yet, there are Waqf governance reforms required to achieve this potential, that is, incorporating its aim into national sustainability and global education policies. Waqf policy, guided strategically, can strike a balance between traditional Islamic charity and contemporary educational needs, thereby becoming a potent force for green competencies and sustainable development.

The linkages between Waqf Policy, Green Learning, and Sustainable Development

Integrating waqf policy and green learning offers significant potential in advancing sustainable development goals (SDGs), particularly in Muslim-majority contexts where waqf plays a substantial role in community-based service delivery. Historically, waqf has supported religious education, health, and welfare. More recently, its scope has expanded to include environmental initiatives such as afforestation, waste management, water conservation, and renewable energy projects (Akhtar, 2024). These activities mirror the aims of SDGs, particularly Goal 6 (clean water), Goal 7 (clean energy), and Goal 13 (climate action). When aligned with structured green learning programmes, waqf-supported initiatives can generate long-term ecological and social benefits, contributing to environmental sustainability and human development.

A vital aspect of this alignment lies in using waqf resources to fund educational institutions and training programmes that promote sustainability competencies. Abubakar and Rahman (2021) illustrate how waqf-based institutions in Nigeria have provided access to education for vulnerable youth, particularly in communities affected by poverty, school dropout, and social instability. These institutions address education gaps and can serve as platforms for delivering environmental education and green skills. In doing so, waqf contributes to SDG 4 (quality education) and supports inclusive lifelong learning. Integrating green learning into waqf-funded

schools enhances their impact by preparing students with practical knowledge in sustainable agriculture, resource management, and renewable technologies sectors critical to green economic transformation.

At the policy level, however, gaps remain in fully connecting waqf frameworks with national sustainability strategies. The European Union's experience in mainstreaming green skills into lifelong learning offers valuable lessons. Bezjak and Štremfel (2024) highlight that despite progressive frameworks, implementation often lacks specific indicators, institutional coordination, and accountability mechanisms. The same challenges can be anticipated within waqf-linked education models if clear governance structures and evaluation tools do not accompany them. To enhance the role of waqf in sustainable development, policies must explicitly define how waqf funds can be used to support green learning, create interagency coordination between religious and environmental authorities, and establish measurable outcomes aligned with SDGs.

The global and regional recognition of green learning as a means of sustainable development is growing. Programs that provide green skills help individuals become knowledgeable and exhibit behaviors for climate resilience, sustainable consumption, and low-carbon innovation. When waqf policies support green learning, they do more than invest in education; and they also shape valuable values, habits, and social norms that are fundamental to the development of sustainable societies. Waqf, because of its religious and cultural authority is uniquely positioned to advocate sustainability efforts in a way that aligns with local beliefs and traditions enhance engagement by communities and contribute to their sense of ownership towards environmental objectives. In conclusion, while the literature does not offer comprehensive frameworks connecting waqf policy, green learning, and sustainable development, the individual components intersect. Waqf contributes funding, infrastructure, and moral legitimacy; green learning provides the tools and mindset for sustainable action; and both reinforce the principles of equity, stewardship, and long-term welfare central to the SDGs. Future research and policymaking should focus on formalising Eco-Waqf models that integrate sustainability curricula, build institutional capacity, and align with national development plans to unlock this synergy. Doing so will elevate waqf from a charitable tradition to a proactive contributor to environmental and human well-being in the 21st century.

Topic Experts

The expanding field of Eco-Waqf has recently been recognised as an area of scholarly interest by a small but impactful group of researchers who are developing knowledge and debate around the potential of Islamic endowment-type arrangements to support environmental sustainability. Abdulfatah Said Mohamed and Ayodele Emmanuel Akande are amongst these notable contributors and their co-authored article is intended to mark important gaps in research on how waqf endowed buildings can achieve sustainable development. According to A. Said Mohamed's research profile, which contains 33 citations and an h-index of 2, he has evidenced substantial engagement with Waqf policy and green infrastructure, providing some expected conversation about the potential to fuse Islamic philanthropic tools with environmental goals. Akande also has some academic history but represents an earlier point in a citation trajectory, offering a new perspective regarding waqf and sustainable architecture and discourse around policy. Their article raised attention to the relative scarcity of scholarship surrounding waqf as it relates to green learning and eco-design, and the need for greater interdisciplinary interaction (Mohamed & Akande, 2025).

Complementing the background of this emerging academic landscape as Hayatullah Imam Khomeini, whose research also implicates Waqf and Zakat mechanisms of Islamic social finance for sustainable development. He has an h-index of 2 and 18 citations. Hayatullah's work focuses on operational synergies among Islamic socially financial tools to improve ecological and educational outcomes in which he introduced Jawwad Mukhlisin and Prima Ramadan with a timely article outlining how Zakat and Waqf could work together to accelerate sustainability that crossed sectors, including education, infrastructure, and community well-being (Mukhlisin, Ramadhan, & Hayatullah, 2025). Collectively, these scholars can provide opportunities for theory and action around Eco-Waqf and green learning..

Collectively, these experts offer diverse but complementary insights that advance the theoretical and practical understanding of Eco-Waqf. Their contributions underscore the need for interdisciplinary collaboration between

architects, policy analysts, Islamic finance scholars, and environmental educators. While the current literature remains sparse, the foundational work by these researchers opens the door to a more integrated research agenda that situates waqf within broader conversations on green infrastructure, climate education, and sustainability governance. Their perspectives make it clear that Eco-Waqf is not merely a philanthropic innovation but a strategic tool for addressing pressing environmental and educational challenges.

In conclusion, the contributions of Mohamed, Akande, and Hayatullah establish a clear pathway for future work in this emerging field. Their research highlights the need for policy frameworks that explicitly define the environmental role of waqf, for capacity building among Waqf administrators, and for curriculum development in sustainability education supported by Islamic endowments. These insights provide a valuable scholarly foundation upon which Eco-Waqf can be scaled and institutionalised, making Islamic philanthropy a powerful driver of environmental stewardship and green learning in the years ahead.

Emerging Themes

Analysing emerging themes in green learning and sustainable development reveals a strong and consistent focus on green pedagogy and eco-literacy. These concepts have been central to environmental education discourse, especially in developing educational systems that cultivate ecological awareness and behavioural change. Green pedagogy is teaching practices that embed environmental consciousness, encourage critical thinking about human–nature relations, and promote sustainable lifestyles. This educational philosophy positions teachers as change agents who are not only transmitters of knowledge but also facilitators of environmentally responsible behaviours. Research has shown that when green pedagogy is integrated into formal curricula, students demonstrate improved eco-literacy and a more substantial commitment to sustainability (Bozkus Kahyaoglu, 2024; Tudball, 2023). Furthermore, the effectiveness of environmental education often hinges on the extent to which teachers understand, value, and apply green pedagogical methods in their classrooms (Kwauk & Casey, 2022).

Related to green pedagogy is eco-literacy which includes the knowledge, skills, and disposition to make mindful decisions about our environmental futures. Eco-literate students are prepared to contribute to a green economy and engage in environmental practices as part of daily life. Research across a variety of educational contexts indicates that sustainability is developed better when concepts around sustainability are integrated into all parts of curricula instead of adding into standalone modules (Žiljak, Pavičić, & Alfrević, 2024). This presents a salient opportunity for Waqf-supported aims and structures, especially Islamic schools and community centres. Waqf policies can help formalise green learning objectives and educators can find support, via religious and ethical education, to establish eco-literacy as a value-ridden component of learning about and in the world. It also creates the possibility of waqf being both a funding mechanism and a means of establishing ongoing ecological awareness within society.

While green pedagogy and eco-literacy represent well-established themes, the rise of green artificial intelligence (AI) and machine learning (ML) introduces a novel and technologically driven dimension to sustainable education. Green AI refers to the use of intelligent systems that reduce the environmental footprint of technology itself and are designed to solve environmental problems such as optimising energy use, predicting pollution patterns, or modelling climate scenarios (Rolnick et al., 2019). When applied in education, AI and ML can transform green learning by personalising content, analysing student progress in real time, and simulating complex ecological systems for immersive learning experiences. For instance, AI-driven platforms can tailor environmental lessons to students' local ecosystems, making abstract sustainability concepts more tangible and locally relevant.

Moreover, leveraging AI and ML in environmental education can address equity gaps by expanding access to quality green learning resources in underserved regions. These technologies can support inclusive and scalable sustainability education through mobile-based learning, data-driven instruction, and adaptive curriculum delivery. In the context of waqf, where educational access is often prioritised for marginalised communities, integrating green AI applications could enhance both the reach and impact of Eco-Waqf initiatives. This innovation is up-and-coming for Islamic philanthropic institutions that seek to combine tradition with forward-

thinking solutions for contemporary global challenges. However, AI and ML must be guided by ethical principles to ensure that technological interventions do not replicate or deepen social inequalities (Vinuesa et al., 2020).

In conclusion, the consistent theme of green pedagogy and eco-literacy underscores the enduring importance of environmentally integrated teaching in shaping sustainable societies. In contrast, the novel theme of green AI and machine learning represents an emerging frontier that blends education with innovation. Together, these themes provide a roadmap for advancing the Eco-Waqf agenda. Waqf institutions can play a pivotal role by supporting teacher training in green pedagogy and investing in digital infrastructure, enabling AI-powered sustainability tools. Future research should test hypotheses such as whether integrating green pedagogy into Waqf-sponsored curricula improves eco-literacy and whether AI-driven learning platforms enhance the delivery of environmental education in Islamic educational contexts. By bridging tradition and technology, these thematic directions hold the potential to make waqf a central pillar in the global movement toward sustainable and equitable education.

CONCLUSION AND RECOMMENDATIONS

This review underscores the new synergy between Waqf policy and green learning and shows its potential to spur sustainable development in social equity, environmental management, and education. The main findings are that waqf, an ancient Islamic benevolence, is being introduced into big environment initiatives like afforestation, water harvesting, and green infrastructure. When complemented by green learning strategies specifically through eco-literacy, green skills development, and infusing environmental values in education institutions, Waqf policy can be instrumental in instilling sustainability mindset and habits among communities.

Theoretically, this review adds to the new field of Eco-Waqf by linking Islamic social finance with sustainability education. It develops traditional Waqf meanings beyond philanthropy and economics and situates it as a means for environmental administration and educational reform. Conceptual basis in this research enhances between faith-based administration, environmental ethics, and educational innovation through green pedagogy, lifelong learning, and AI in education.

In practice, the research indicates a number of policy and institutional intervention options. Waqf institutions, Islamic education schools and centres, and government departments can work together to integrate environmental issues in Waqf-subsidised schools and at the grass-roots level. Prioritising teacher training in green pedagogy, curriculum material development on sustainability, and investing in green technology infrastructure can enhance the scope and coverage of such programs. Moreover, the convergence of AI and machine learning presents a new window of opportunity for Waqf institutions to amplify digital environmental education, particularly in rural areas.

This research is limited. Most of the observations are based on secondary sources and thematic abstraction, not empirical field observations. Little direct evidence exists connecting Waqf policy to green education or environmental performance results. Although the literature lends itself to the possibility of alignment, there is too little data on policy implementation, monitoring processes, and educational output in Waqf institutions to make definitive statements.

Subsequent studies should investigate these intersections empirically by charting the current Waqf initiatives which have incorporated green learning, measured their educational and environmental outcomes, and evaluating the perceptions of the community. Comparative case studies in different areas of Waqf institutional development might lead to the identification of best practices and context-related challenges. Besides that, additional research would be conducted on how Waqf institutions can be innovated to embrace emerging technologies in sustainability education and explore the governance structures to ensure such reforms would last for the long run.

ACKNOWLEDGEMENT

The authors would like to sincerely thank the Kedah State Research Committee, UiTM Cawangan Kedah, for the generous funding provided under the Tabung Penyelidikan Am. This support was crucial in facilitating the research and ensuring the successful publication of this article.

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