

Unlocking idle waqf assets through institutionalized pentahelix collaboration: Evidence from North Sumatra, Indonesia

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ABSTRAK

Introduction

Waqf, an Islamic endowment intended for perpetual public benefit, remains one of the least-leveraged instruments of regional development in Indonesia. In North Sumatra a large share of endowed land is legally uncertified and economically idle, reflecting weak managerial capacity and fragmented multi-stakeholder coordination.

Objectives

This study investigates whether an institutionalized Pentahelix governance framework, uniting academia, business, community, government, and media, can transform dormant waqf assets into productive ventures that advance sustainable socio-economic goals.

Method

A sequential-exploratory case-study design combined forty semi-structured interviews, extended participatory observation in five waqf institutions, and systematic document analysis of legal records, financial reports, and policy papers. Data were coded thematically using Miles and Huberman's interactive model, displayed in cross-stakeholder matrices, and triangulated to strengthen analytic credibility.

Results

Five mutually reinforcing bottlenecks emerged: limited public literacy, low professional competence among nazhir (waqf managers), protracted land-title certification, the absence of an

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integrated digital registry, and ad-hoc stakeholder collaboration. Universities and government agencies show relative engagement, whereas businesses and media remain peripheral, leaving community actors to operate in isolation. A five-lever blueprint, regional synergy forum, professional certification pathways, province-wide digital ledger, targeted fiscal incentives for corporate waqf, and sustained media literacy campaigns, offers an actionable route to align legal certainty, data transparency, and participatory governance.

Implications

Implementing the proposed blueprint would unlock latent economic value, strengthen public trust, and align North Sumatra's waqf sector with national Islamic-finance reforms and the United Nations Sustainable Development Goals. The model balances religious legitimacy with market discipline, demonstrating how social-justice mandates can coexist with competitive financial performance.

Originality/Novelty

By integrating "hard" infrastructural prerequisites, secure certification and digital systems, with "soft" relational capital generated through Pentahelix collaboration, the research extends existing theory and supplies a replicable governance template for Islamic social finance.

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INTRODUCTION

Over the past two decades, *waqf*, the Islamic endowment institution, has reemerged as a vital component of social and economic development across Muslim-majority countries. Historically rooted in Islamic civilization as a mechanism for perpetual charity, waqf has long served as a foundation for advancing education, healthcare, and poverty alleviation. In modern times, as Muslim societies confront complex socio-economic disparities, waqf institutions are increasingly recognized as strategic tools for sustainable development (Alam, 2018; Usman & Ab Rahman, 2023). They contribute not only to the provision of religious and social infrastructure but also to the empowerment of communities through entrepreneurship, microfinance, and education (Haneef et al., 2015; Umar et al., 2022). Empirical research shows that innovations such as *cash waqf* and the digitalization of endowment management have expanded the accessibility and efficiency of waqf practices, allowing for broader participation and improved accountability (Bonang et al., 2024; Kasri & Chaerunnisa, 2022). These transformations align waqf with contemporary Islamic finance trends, reflecting its adaptability to changing socio-economic contexts.

Despite this progress, the effectiveness of waqf institutions varies significantly among Muslim countries, largely depending on governance quality, legal frameworks, and managerial capacity. In regions where waqf governance is well structured, such as Malaysia, Turkey, and certain Gulf states, endowment assets have become powerful

instruments for social and economic transformation (Mahsun et al., 2022; Nienhaus, 2018). Conversely, in other contexts, including parts of Indonesia, waqf institutions continue to face considerable challenges. Weak administrative systems, limited transparency, and fragmented coordination often hinder the productive utilization of waqf assets (Kamaruddin et al., 2024). These structural deficiencies not only constrain financial performance but also erode public trust, which is crucial for sustaining endowment growth (Sano & Kassim, 2021). Given that Indonesia is home to one of the largest Muslim populations globally, the underperformance of its waqf sector represents both a challenge and an opportunity for national socio-economic advancement.

Within Indonesia, North Sumatra serves as a compelling microcosm of these broader dynamics. Data from the *Indeks Wakaf Nasional* (IWN) reveal that while the province's waqf index rose from 0.070 in 2021 to 0.172 in 2022, it remains among the lowest nationwide. The province possesses over 11,000 registered waqf locations covering nearly 8,000 hectares, yet more than 40 percent remain uncertified, and the majority of assets are still devoted to religious or social use, such as mosques and cemeteries. Productive waqf, particularly for income-generating ventures, remains marginal, reflecting the limited managerial capacity of *nazhir* (waqf managers) and the absence of structured collaboration among key institutions. The low level of public literacy regarding waqf further constrains asset optimization. Consequently, North Sumatra's waqf sector embodies a paradox of high potential yet limited performance, emphasizing the urgent need for institutional innovation and integrative governance.

The core challenge, therefore, lies in the governance and management of waqf institutions. Multiple studies highlight that the main obstacles include weak transparency, insufficient accountability, outdated regulatory frameworks, and inadequate managerial training (Mahsun et al., 2022; Priyadi et al., 2022; Suhaili et al., 2018). Many *nazhir* lack the financial literacy and technical competence necessary for managing waqf assets productively, leading to underutilization of valuable resources. Fragmentation in administrative responsibilities, often spread across religious offices, local governments, and independent waqf boards, further complicates coordination (Sudirman et al., 2022). The result is a fragmented ecosystem where efforts to modernize waqf management proceed in isolation rather than synergy. These issues, when compounded by weak data integration and low community engagement, obstruct the realization of waqf's full socio-economic potential in the region.

Several reform efforts have been introduced to address these deficiencies. At the national level, the Indonesian Waqf Board (*Badan Wakaf Indonesia*, BWI) has developed policy instruments to professionalize waqf management through certification programs, digital registration systems such as SIWAK, and the introduction of cash waqf-linked financial instruments (Anggraini et al., 2024; Santoso & Fahrullah, 2020). However, implementation at the provincial and local levels has often been inconsistent, constrained by limited institutional capacity and resource disparities. Scholars have proposed various solutions to strengthen waqf governance, including codified legal frameworks, transparent reporting mechanisms, and the adoption of modern financial

management systems (Hj. Mohaiyadin et al., 2022; Mujahidin et al., 2025). Yet, while these measures address specific administrative concerns, they do not adequately tackle the systemic lack of coordination among the diverse actors influencing waqf development.

A growing body of literature advocates for a shift from isolated institutional management to collaborative governance models that integrate diverse stakeholders in policy formulation, resource mobilization, and innovation. Among these, the Pentahelix model, a multi-stakeholder framework encompassing academia, business, community, government, and media, has demonstrated substantial promise (Calzada, 2020; Herfiantara & Hariadi, 2023). Originating from the innovation ecosystem theory, the model extends the traditional Triple Helix framework by adding community and media actors, thereby creating a comprehensive collaborative structure for societal transformation. In Indonesia, the Pentahelix model has been applied successfully in several community-based and social finance initiatives, fostering cross-sector partnerships and co-creation of value (Mahmudi & Muhammad, 2022). Such collaboration encourages resource sharing, aligns interests, and integrates traditional social capital with contemporary management practices, making it particularly suitable for revitalizing the waqf sector.

Globally, similar multi-stakeholder approaches have enhanced the governance of social finance mechanisms. Studies indicate that structured collaboration between public agencies, private enterprises, and civil society can accelerate progress toward the Sustainable Development Goals (SDGs) by enabling more inclusive and culturally responsive development interventions (Elmahgop et al., 2025; Mukhlisin et al., 2025). When adapted to waqf, this model fosters innovation in fund mobilization, policy coordination, and digital transformation, allowing endowments to address local community needs while maintaining sharia compliance. In North Sumatra, where waqf management remains fragmented, the introduction of a Pentahelix-based governance model could establish the missing link between potential and performance, ensuring that waqf assets contribute directly to poverty reduction, education, and regional economic growth.

Empirical evidence from related research further underscores the transformative potential of productive waqf models that integrate financial innovation and community participation. Cash waqf, in particular, offers flexibility for investment in education, healthcare, and microenterprise development (Ascarya et al., 2022; Medias et al., 2022). The integration of cash waqf with modern financial instruments such as sukuk has proven effective in mobilizing large-scale capital while ensuring sustainability (Said et al., 2024; Wijaya, 2023). Similarly, technological innovations, including blockchain-based tracking systems and digital fundraising platforms, enhance transparency and donor confidence (Hj. Mohaiyadin et al., 2022; Jafar et al., 2025). These innovations, when embedded in a collaborative governance structure, can significantly improve both efficiency and public engagement. As shown in studies of waqf-linked fintech systems, digitalization not only democratizes participation but also strengthens regulatory compliance and institutional accountability (Chong, 2021; Yusof, 2024).

Nevertheless, existing research reveals critical gaps in understanding how multi-stakeholder collaboration can be systematically institutionalized within Indonesia's waqf governance framework. While the theoretical and empirical benefits of productive waqf and technological integration are well documented, the mechanisms for aligning diverse stakeholders, governmental bodies, academic institutions, private enterprises, and community organizations, remain underexplored. The Pentahelix model, despite its growing adoption in regional development (Insani et al., 2023; Sumarto et al., 2020) and innovation ecosystems (Capetillo et al., 2021; Pratiwi et al., 2025), has rarely been operationalized as a structured framework for waqf management. Consequently, there is limited empirical evidence on how this model can foster synergy among actors, improve efficiency, and enhance social impact within the waqf sector, especially in contexts characterized by regulatory and administrative fragmentation such as North Sumatra.

This study seeks to fill this gap by exploring and developing a Pentahelix-based model for waqf development in North Sumatra, focusing on collaboration among key stakeholders to enhance governance, productivity, and sustainability of waqf assets. Specifically, it aims to (1) identify the prevailing conditions, challenges, and supporting factors in the province's waqf ecosystem; (2) analyze stakeholder roles and the extent of their synergy; and (3) formulate a collaborative model tailored to local socio-economic and institutional contexts. The novelty of this research lies in its interdisciplinary synthesis, integrating Islamic social finance, innovation systems theory, and collaborative governance, to propose a comprehensive framework for waqf revitalization. In doing so, the study contributes theoretically by operationalizing the Pentahelix model within the Islamic economic domain, and practically by offering a policy-oriented roadmap for optimizing waqf's role in sustainable development.

Ultimately, this investigation positions waqf not merely as a religious obligation but as a dynamic instrument of socio-economic transformation. Through structured multi-actor collaboration, digital integration, and capacity building, waqf can transcend its traditional philanthropic role to become a cornerstone of inclusive, community-driven development. By demonstrating the practical application of the Pentahelix framework in waqf governance, this study aims to provide a replicable model that can inform both regional and national strategies for strengthening the institutional architecture of Islamic endowments across Indonesia and beyond.

LITERATURE REVIEW

Evolution of Waqf in Modern Islamic Economics

The evolution of *waqf* from a classical religious endowment to a modern financial instrument demonstrates a dynamic transformation within Islamic economics. Historically, waqf served primarily philanthropic purposes, supporting mosques, education, and charitable services within Muslim communities (Misbah et al., 2022). Over time, however, scholars recognized its broader potential as an enduring mechanism for wealth redistribution and social welfare (Alam, 2018; Ramdani et al.,

2024). Modern reinterpretations of waqf emphasize its capacity to generate sustained socio-economic benefits, aligning the institution with the principles of financial inclusion and long-term social justice that underlie Islamic economic thought.

By the late twentieth century, the conceptual boundaries of waqf had expanded to integrate financial instruments compatible with contemporary market systems. The emergence of cash waqf represented a fundamental shift, allowing liquidity, flexible participation, and more effective capital mobilization for development projects (Ascarya & Masrifah, 2023). Unlike fixed-asset waqf, cash-based models enhance fund utilization and enable broader donor involvement across social strata (Ayub et al., 2024). These mechanisms position waqf as a versatile pillar of Islamic social finance, responsive to emerging economic demands while remaining consistent with Sharia principles of benevolence and sustainability (Qurrata et al., 2024).

This transformation situates waqf within the broader global agenda of sustainable development. Studies confirm that properly managed waqf can advance multiple Sustainable Development Goals (SDGs), particularly those targeting poverty reduction, education, and environmental stewardship (Ibrahim et al., 2023; Jannah et al., 2024; Megat et al., 2024). The introduction of digital platforms, crowdfunding, and blockchain-based waqf management further enhances transparency and public trust (M. Abdullah, 2018; Siddiq et al., 2025). Consequently, waqf now functions as both a moral and economic institution, bridging faith-based philanthropy and professional financial management to address contemporary global challenges (Abdul Majid et al., 2024).

Governance and Institutional Reform in Waqf Management

Effective governance is a decisive factor in ensuring transparency and accountability within waqf institutions. Malaysia provides a leading example through its comprehensive Waqf Enactment, which defines the duties of *nazhir* and establishes regular audit requirements (R. Hasan et al., 2022; Kamaruddin & Mohd Hanefah, 2021). This legal clarity strengthens public confidence and encourages community participation in waqf initiatives. In contrast, Turkey's centralized model, administered by the Directorate General of Foundations, illustrates the advantages of unified oversight and streamlined asset management (M. Abdullah, 2018; Kayadibi et al., 2017; Koç, 2013; Nordjo et al., 2025). Both systems demonstrate that codified frameworks and consistent supervision are essential for institutional integrity.

The GCC countries, particularly Saudi Arabia and the United Arab Emirates, integrate waqf management within national development agendas such as Vision 2030, emphasizing investment efficiency and digital innovation (Elmahgop et al., 2025). Initiatives like waqf investment funds and blockchain-enabled registries illustrate how technology can reinforce transparency (Hj. Mohaiyadin et al., 2022). Moreover, public-private partnerships (PPPs) have become integral to waqf administration in these regions, linking religious institutions with business and state actors to achieve shared socio-economic outcomes (Akhtar, 2024). These models collectively demonstrate diverse but complementary strategies for reform.

Institutional reform literature stresses professional capacity building and independent oversight as prerequisites for effective management. Training programs that strengthen the financial literacy and strategic planning skills of *nazhir* have proven instrumental in improving governance outcomes (Kamaruddin & Mohd Hanefah, 2021; Mujahidin et al., 2025). Equally important are inclusive councils that represent multiple stakeholders, ensuring waqf management remains responsive to community priorities (Nordjo et al., 2025). Legal modernization, updating outdated regulations and embedding digital compliance mechanisms, enables more adaptive and transparent systems (Hj. Mohaiyadin et al., 2022). Collectively, these reforms suggest that robust governance and modern regulatory infrastructure are fundamental to revitalizing waqf's developmental role.

Productive and Innovative Waqf Models for Socio-Economic Impact

Recent empirical studies emphasize that productive waqf models, such as cash waqf, waqf-linked sukuk, and integrated microfinance, can transform charitable endowments into engines of socio-economic development. Cash waqf facilitates small-scale financing for entrepreneurship and poverty alleviation, offering capital access without interest-based lending (R. Abdullah & Ismail, 2017; Ascarya & Masrifah, 2023; Rofiqoh et al., 2021). These funds have enabled micro-entrepreneurs to launch and expand businesses, particularly in Indonesia and Malaysia, thereby increasing employment opportunities and improving household incomes.

Waqf-linked sukuk combine Islamic endowment principles with capital-market instruments to finance public infrastructure and social services. Evidence from Indonesia indicates that such instruments generate both financial returns and measurable community benefits in sectors like healthcare and education (Elmahgop et al., 2025; Said et al., 2024; Yumna et al., 2024). This model institutionalizes sustainability by reinvesting profits into additional waqf projects, thereby establishing a self-perpetuating funding cycle aligned with the SDGs. Its hybrid nature bridges philanthropic and investment paradigms, offering a replicable blueprint for other Muslim economies.

Integrated microfinance models utilizing waqf resources further expand access to capital for underprivileged groups (Ascarya et al., 2022; Ibrahim et al., 2023). Unlike conventional microfinance, waqf-based programs operate on risk-sharing and community solidarity principles, minimizing debt burdens while maximizing social impact. Empirical evidence reveals improved education attainment, healthcare access, and women's economic empowerment in communities participating in these schemes (Sukmana et al., 2024; Yusof, 2024). Thus, productive waqf not only fosters individual entrepreneurship but also reinforces broader community resilience and equitable growth trajectories.

Multi-Stakeholder Collaboration and the Pentahelix Model

The Pentahelix model, encompassing government, academia, industry, community, and media, provides a collaborative governance framework particularly suited to

Islamic social finance. Multi-stakeholder partnerships have been shown to improve transparency and inclusivity in waqf operations. In Indonesia, cooperation among *nazhir*, microfinance institutions, and local communities enhances fund management and impact accountability (Ascarya & Masrifah, 2023; Sukmana et al., 2024). By synchronizing diverse expertise and resources, these alliances enable more strategic deployment of waqf assets for social welfare.

Collaboration also drives innovation by integrating research, policy, and technology. Academic institutions contribute through evidence-based policymaking and program evaluation, as demonstrated by studies linking university involvement to improved governance and innovative project design (Zawawi et al., 2023). Furthermore, partnerships with fintech firms and social enterprises have spurred the development of digital waqf and crowdfunding mechanisms, improving efficiency and donor outreach (Wahyudi et al., 2024). Such synergy reflects the Pentahelix emphasis on co-creation, uniting theory, policy, and practice under shared sustainability objectives.

Sustainability outcomes are strengthened when collaborative frameworks align with national SDG commitments (Nygymetova et al., 2025; Shrestha & L'Espoir Decosta, 2025). Joint initiatives between governmental and civil-society actors ensure waqf investments address pressing community needs in education, health, and poverty alleviation (Muhammad, 2010; Simbar, 2024; Tok et al., 2022). Evidence from Indonesia shows that integrating waqf and zakat under cooperative management fosters measurable improvements in living standards (Ascarya et al., 2022; Maulana, 2024; Rahmadhani & Rohim, 2024; Zulkipli et al., 2025). Thus, the Pentahelix model's inclusive, multi-actor design provides a robust theoretical and operational foundation for sustainable waqf-based development.

Digital Transformation and Technological Integration

Digitalization represents the most transformative trend in contemporary waqf management. Technologies such as blockchain, fintech, and data analytics enhance transparency by creating immutable transaction records and automating reporting systems (Almadadha, 2024; Chen et al., 2024; Prokopenko et al., 2024). Blockchain applications ensure verifiable audit trails, mitigating risks of corruption or fund misallocation, while real-time digital dashboards increase information accessibility for donors and regulators (Bustamante et al., 2022; Mhlanga, 2023). These innovations foster trust and accountability, core principles of both Sharia governance and modern financial ethics.

Efficiency gains stem from automation and digitized financial flows. Fintech platforms and digital wallets streamline contributions, distribution, and monitoring, reducing administrative costs and delays (Hatimah et al., 2024; Hoque et al., 2024; Maharani et al., 2024; Rizvi et al., 2024; Yuniati et al., 2024). Studies report significant improvements in processing time and fund utilization rates, enabling waqf institutions to focus more on impact evaluation and program design rather than paperwork (Al-Saudi, 2024; Anwar et al., 2024; Ibrahim, 2023). By adopting integrated information

systems, organizations can manage diverse waqf portfolios effectively, aligning operational performance with strategic goals.

Equally crucial is public engagement through digital outreach. Online fundraising, social-media campaigns, and mobile applications have expanded participation among younger, tech-savvy donors (Andriansyah, 2024; Ariffin et al., 2025; Bonang et al., 2025; Munifatussaidah et al., 2025; Rakhmawati & Rizky, 2023). Data analytics tools now allow institutions to map donor behavior and optimize engagement strategies (Yusof, 2024). Internationally, Malaysia's cash-waqf-linked sukuk and GCC fintech-based waqf models exemplify the scalability of digital integration (Qurrata et al., 2024; Zawawi et al., 2023). Overall, technological innovation strengthens transparency, efficiency, and inclusivity, transforming waqf from a traditional charity model into a digitally empowered, socially impactful financial institution.

Synthesis of Theoretical and Empirical Insights

Across the literature, a convergent narrative emerges: the modernization of waqf requires a synergy between institutional governance, financial innovation, digital transformation, and multi-stakeholder collaboration. The integration of productive waqf mechanisms, Pentahelix governance, and digital technologies reveals a coherent framework for sustainable Islamic social finance. Comparative evidence from Malaysia, Turkey, and the GCC underscores the necessity of legal modernization and professionalization, while Indonesian studies highlight contextual challenges of fragmentation and capacity gaps.

Collectively, these findings illustrate waqf's dual identity, as a moral institution anchored in Islamic ethics and as a pragmatic financial instrument aligned with global development paradigms. The reviewed literature substantiates that effective waqf management depends on transparent governance, professional accountability, and innovation grounded in collaboration and technology. These theoretical and empirical insights establish a solid foundation for developing a Pentahelix-based model of waqf governance, designed to enhance the socio-economic welfare of communities in North Sumatra and the wider Muslim world.

Research Gap and the Significance of the Study

Although extensive research has explored the modernization of *waqf* through governance reform, financial innovation, and digital transformation, existing studies reveal a persistent fragmentation between theoretical frameworks and practical implementation, particularly within Indonesia's provincial contexts. Most literature emphasizes macro-level policy or national models, yet few empirically investigate how collaborative governance, specifically the Pentahelix model, can be systematically institutionalized to strengthen regional waqf ecosystems. Furthermore, limited studies examine the interaction between stakeholders across the five helices, academia, business, community, government, and media, in shaping productive and sustainable *waqf* development.

This study addresses these gaps by developing and contextualizing a Pentahelix-based collaborative governance model for *waqf* in North Sumatra. By integrating insights from global best practices, Islamic social finance, and digital innovation, the research contributes both theoretically and practically. It extends the discourse on multi-stakeholder governance in Islamic philanthropy and offers an operational framework for strengthening transparency, efficiency, and socio-economic impact within Indonesia's *waqf* management. The findings are expected to guide policymakers and *waqf* institutions in fostering sustainable community empowerment through evidence-based, collaborative approaches.

METHOD

Research Design

This study employed a qualitative descriptive approach using a sequential exploratory design to investigate the development of *waqf* governance and the potential implementation of the Pentahelix model in North Sumatra. The qualitative orientation was chosen to capture the complexity of stakeholder interactions, institutional challenges, and contextual dynamics that cannot be fully represented through quantitative measures. This design allowed for in-depth exploration of perceptions, practices, and collaborative mechanisms among *waqf* stakeholders, followed by analytical synthesis to propose a structured governance model. As suggested by previous works (Avgerou, 2019; Davidoff, 2019; Gogo & Musonda, 2022; Makri & Neely, 2021), exploratory designs are appropriate when existing theories require contextual adaptation or when new frameworks, such as the application of Pentahelix to *waqf*, are being developed from empirical realities.

The research unfolded through two main stages: (1) exploratory data collection through field research, including interviews and observations to identify challenges, practices, and expectations regarding *waqf* management; and (2) conceptual development, where findings were systematically analyzed and mapped onto the Pentahelix framework. This process ensured a grounded theoretical foundation for the proposed model while maintaining empirical validity through triangulated evidence from diverse actors and institutions.

Research Location and Context

The research was conducted in North Sumatra Province, Indonesia, selected due to its significant *waqf* potential and persistent managerial challenges. The province records 11,857 *waqf* land locations, encompassing approximately 7,942 hectares, yet only about 57 percent are certified, and the majority are devoted to religious and social purposes such as mosques, cemeteries, and schools. Productive *waqf* remains underdeveloped, with limited digitalization and low literacy among the public and *nazhir* (*waqf* administrators). The selection of North Sumatra was therefore strategic to capture the tension between *waqf* potential and institutional performance, reflecting the national condition where the Indeks Wakaf Nasional (IWN) for the province remained at 0.172 in 2022, among the lowest in Indonesia.

This setting also provides a representative case for analyzing the interplay between government agencies, local religious institutions, academic entities, and private organizations involved in Islamic philanthropy. The study contextually situates waqf within the broader framework of Indonesia's National Waqf Roadmap 2024–2029, which promotes education, innovation, and digitalization in waqf management. Consequently, North Sumatra offers both empirical diversity and policy relevance, making it a critical locus for developing an applied collaborative governance model.

Data Sources and Participants

Data were collected from primary and secondary sources. Primary data came from in-depth interviews, field observations, and focus group discussions (FGDs), while secondary data were obtained from institutional reports, *waqf* registries (e.g., SIWAK), legal documents, and statistical publications. Participants were selected through purposive sampling, ensuring the inclusion of key representatives across the five Pentahelix dimensions:

1. Academia – scholars and researchers specializing in Islamic economics and social finance.
2. Business sector – corporate social responsibility (CSR) managers and Islamic financial institutions.
3. Community – *nazhir*, religious leaders, and community organizations managing *waqf* properties.
4. Government – officials from the Ministry of Religious Affairs, BWI (Badan Wakaf Indonesia), and local authorities.
5. Media – journalists and communication officers engaged in public education on *waqf*.

This selection ensured comprehensive coverage of actors involved in *waqf* governance and development. A total of 25 participants were interviewed, representing provincial and district-level stakeholders. Such diversity provided nuanced perspectives on the operational, regulatory, and social dimensions of *waqf* management.

Data Collection Techniques

Interviews

Semi-structured interviews served as the primary instrument for data collection. The format provided flexibility to probe participants' experiences, motivations, and perceptions while maintaining focus on key research questions. Interview guides were constructed around four themes: (1) the current condition of *waqf* management; (2) institutional challenges and opportunities; (3) stakeholder roles and collaboration patterns; and (4) perspectives on implementing a Pentahelix-based governance model. Each interview lasted between 60 and 90 minutes and was recorded with participants' consent. Interviews were conducted both face-to-face and via online platforms to ensure accessibility.

Observation

Field observations complemented the interviews by enabling direct engagement with *waqf* institutions, including mosques, schools, and BWI offices. Observations focused on administrative processes, land utilization practices, documentation, and public outreach activities. This method provided contextual insights into organizational behavior and coordination among stakeholders, confirming or contrasting statements made during interviews.

Documentation

Document analysis was employed to corroborate and enrich findings. Reviewed materials included official reports from BWI, the Ministry of Religious Affairs, and provincial governments; legal instruments such as *Peraturan Menteri Agama*; and empirical data from the SIWAK registry. Additional academic references and policy papers were examined to situate the study within the broader scholarly discourse on *waqf* governance and Islamic social finance. Document analysis ensured triangulation of information across multiple evidence sources.

Data Analysis

The study applied a qualitative content analysis method following Miles et al. (2020), which includes three concurrent stages: data reduction, data display, and conclusion drawing/verification.

- Data reduction involved organizing raw data from interviews, observations, and documents into thematic categories corresponding to research objectives—such as governance, collaboration, technology integration, and socio-economic outcomes.
- Data display entailed synthesizing the categorized information in matrices and conceptual maps, highlighting the relationships among stakeholders and identifying systemic gaps.
- Conclusion drawing and verification were conducted iteratively through triangulation and member checking, ensuring that interpretations accurately reflected participants' perspectives.

Analytical coding followed both inductive and deductive procedures. Inductive coding allowed patterns to emerge from empirical data, while deductive coding applied constructs from the Pentahelix framework to classify and interpret stakeholder interactions. The analysis sought to answer how collaborative mechanisms could be institutionalized to improve *waqf* governance, culminating in a conceptual model adapted to North Sumatra's context.

Validity and Reliability

Credibility was ensured through triangulation of data sources and methods, incorporating multiple stakeholders, observation sites, and document types. Member checking was conducted by returning key findings to selected participants for verification, thereby confirming the accuracy of interpretations. Peer debriefing among academic colleagues further enhanced analytical rigor, while an audit trail

documented the research process transparently from data collection to conclusion. Transferability was supported through detailed contextual descriptions, enabling other researchers to assess the applicability of findings to different regions or institutional settings.

Dependability and confirmability were achieved through consistent data management and reflective analysis. Notes and recordings were securely stored, and coding procedures were systematically documented to ensure replicability. These steps collectively established methodological rigor in line with qualitative research standards in social sciences.

Ethical Considerations

Ethical integrity was upheld throughout the research. Prior to data collection, participants were informed of the study's objectives, confidentiality measures, and their right to withdraw at any stage. Written consent was obtained for all interviews and observations. Data anonymity was maintained by using pseudonyms and excluding identifying details in reporting. The research protocol adhered to ethical guidelines of qualitative inquiry, respecting cultural and religious sensitivities associated with *waqf* institutions.

Given the involvement of religious actors and public officials, the researcher ensured neutrality and transparency in communication, preventing any conflict of interest. Ethical clearance was obtained from the institutional review committee, and all field activities followed Indonesia's research ethics standards as stipulated by the Ministry of Religious Affairs and BWI regulations.

Model Development Procedure

Following data analysis, the study proceeded to formulate the Pentahelix-Based Waqf Development Model. This process integrated empirical findings with theoretical constructs from the Pentahelix literature and best practices in *waqf* governance. The model was constructed inductively from coded data patterns illustrating stakeholder roles, collaboration gaps, and enabling factors such as digitalization, policy support, and capacity-building initiatives.

A validation workshop was subsequently held with representatives from each stakeholder group to evaluate the model's feasibility and adaptability. Feedback from participants was incorporated to refine the framework into a context-sensitive governance design emphasizing coordination, accountability, and inclusiveness. The final model aligns with Indonesia's national *waqf* roadmap, proposing strategic interventions at institutional, regulatory, and technological levels to enhance productivity and sustainability of *waqf* assets.

RESULTS

Overview of Empirical Findings

The findings reveal that *waqf* management in North Sumatra has yet to achieve systemic effectiveness or sustainability. Despite the province's vast *waqf* potential,

covering more than 7,900 hectares across 11,857 registered sites, its institutional and managerial frameworks remain fragmented. The *nazhir* system operates predominantly on a voluntary basis, lacking structured professionalization and long-term planning mechanisms. Public literacy concerning *waqf* is still limited, resulting in low participation in productive *waqf* programs. The absence of an integrated *waqf* database further constrains asset optimization and accountability. Additionally, coordination between key stakeholders, academia, business, government, community, and media, remains ad hoc and short-term, occurring mainly through isolated projects rather than formalized institutional partnerships. Field data reveal some structural bottlenecks that recurrently undermine efforts to professionalize *waqf* governance (Table 1).

Table 1

Principal Challenges in Managing Waqf in North Sumatra

No.	Challenge Area	Core Problem Statement
1	Public literacy	Limited understanding of productive <i>waqf</i> ; community still equates <i>waqf</i> with land donations for mosques or cemeteries.
2	Nazhir capacity	Most <i>nazhir</i> lack professional asset-management and Islamic-finance skills; training opportunities are scarce.
3	Legal certification	A high share of <i>waqf</i> land remains uncertified, creating legal risk and blocking development.
4	Information systems	No integrated, digital database exists to track assets or monitor <i>nazhir</i> performance.
5	Stakeholder collaboration	Cross-sector coordination is ad-hoc and project-based, with no long-term platform.

Source: Primary data. Authors' analysis.

From a governance perspective, both academic institutions and government agencies dominate the regulatory and literacy spheres. Meanwhile, private enterprises and media organizations have yet to play significant roles in advancing innovation, investment, and public engagement in *waqf* initiatives. The Pentahelix framework developed in this study identifies this asymmetry as a critical structural limitation that hampers comprehensive collaboration across sectors. The findings also underscore that digital transformation and data-driven planning remain underutilized, weakening transparency and public trust. This indicates a pressing need for a more integrated model of *waqf* management grounded in multi-stakeholder synergy.

Institutional Conditions and Managerial Effectiveness

The study found that the majority of *nazhir* institutions in North Sumatra lack financial expertise, human resource capacity, and technological competence. Most administrators serve on a voluntary basis with minimal formal training. While their commitment is high, their effectiveness is constrained by limited knowledge of investment, accounting, and risk management. Furthermore, institutional performance is weakened by regulatory ambiguity and the absence of a unified *waqf* authority coordinating provincial and district-level operations.

The study also notes disparities between urban and rural *waqf* management capacities. Urban *nazhir* tend to have better access to information, partnerships, and technology, while rural administrators remain confined to traditional management practices. Consequently, most *waqf* assets are static or unproductive, primarily allocated to religious facilities rather than economically productive ventures. This imbalance underscores the need for targeted capacity-building programs and incentives to encourage professionalization. The data emphasize that institutional reform must prioritize training, certification, and financial autonomy of *nazhir* to achieve efficient *waqf* asset utilization.

Stakeholder Collaboration in the Pentahelix Framework

The Pentahelix analysis highlights uneven participation among stakeholders (Table 2). The government and academia emerged as the most active pillars, focusing primarily on policy, regulation, and literacy promotion. Academia contributed significantly through research, training, and public education, particularly in collaboration with the Ministry of Religious Affairs and the Indonesian Waqf Board (BWI). However, these initiatives often lack follow-up mechanisms and measurable outcomes. The business sector's participation remains minimal, despite its potential to provide investment capital and innovation for productive *waqf* ventures. Similarly, the media's engagement is largely limited to ceremonial or campaign-based coverage, with minimal advocacy for policy reform or public accountability.

Table 2

Stakeholder Involvement in Developing Waqf in North Sumatra

No.	Stakeholder	Current Role	Engagement Level	Additional Remarks
1	Academia	Research and education	High	Rich body of studies and outreach; limited implementation follow-up.
2	Business	Largely passive	Low	Firms seldom regard waqf as a viable social-investment vehicle.
3	Community	Grass-roots executor	Moderate	Active on the ground but loosely organized.
4	Government	Regulation & certification	High	Active through BWI, MoRA, ATR/BPN, yet lacks integrative policy.
5	Media	Public socialization	Low	Coverage is ceremonial; few educational features.

Source: Primary data. Authors' analysis.

Community organizations, including *nazhir* and local religious leaders, represent the most consistent actors in day-to-day *waqf* activities but operate in isolation. Interviews revealed that most *nazhir* perceive *waqf* as a form of charity rather than a development instrument, limiting innovation and collaboration. Consequently, multi-sectoral partnerships remain sporadic and short-lived. The absence of a coordinating body that aligns interests and responsibilities among the five helices leads to inefficiencies and duplication of efforts. This finding reinforces the argument that

collaborative governance in *waqf* requires formal institutional mechanisms to ensure synergy, accountability, and sustainability.

Digitalization and Data Management Challenges

Digital transformation in *waqf* management remains at an early stage. Although some institutions have adopted digital platforms for donation tracking and reporting, there is no standardized provincial database for asset registration or performance monitoring. The national *SIWAK* system has not been fully integrated into local operations due to limited infrastructure, technical training, and institutional support. As a result, data inconsistencies persist between provincial and central records, leading to difficulties in auditing and planning. Respondents also cited inadequate cybersecurity awareness and lack of digital literacy among *nazhir* as key barriers to effective digitalization.

Nonetheless, a growing awareness of digital potential was evident among younger administrators and community organizations. Initiatives such as online *cash waqf* fundraising, inspired by models in Malaysia and Indonesia's urban centers, indicate emerging innovation pathways. Respondents emphasized the need for user-friendly systems that facilitate transparency, real-time reporting, and donor engagement. In the North Sumatran context, digital transformation must therefore be positioned as both a governance reform and a community engagement strategy.

Policy Environment and Regulatory Gaps

The research found that existing policies related to *waqf* governance in North Sumatra are fragmented and lack binding enforcement mechanisms. Although the *Badan Wakaf Indonesia* (BWI) serves as the central regulatory body, its coordination with provincial governments is limited by bureaucratic inertia and overlapping jurisdictions. Local regulations primarily focus on administrative certification rather than on productive utilization or impact evaluation. Interviews revealed that several *nazhir* and local officials were unaware of the *National Waqf Roadmap 2024–2029*, reflecting the communication gap between national directives and regional implementation.

The findings also show that there are no concrete incentives for private sector involvement in *waqf* development. Tax benefits and investment guarantees—key features in countries like Malaysia and Turkey—are absent in Indonesia's regional *waqf* framework. This policy vacuum discourages corporate social responsibility (CSR) initiatives from channeling resources into *waqf*-based projects. Respondents argued for stronger regulatory clarity and fiscal incentives to promote cross-sector participation. The results confirm that effective policy reform must integrate both top-down regulation and bottom-up community engagement to institutionalize the Pentahelix framework in *waqf* governance.

Socio-Cultural and Educational Dimensions

Cultural attitudes play a substantial role in shaping *waqf* participation. In many communities, *waqf* is still viewed as a purely religious act rather than an economic empowerment tool. This perception limits innovation and the willingness to engage in productive *waqf* initiatives. Educational programs related to Islamic social finance

remain sporadic, and public literacy about the economic potential of *waqf* is low. The research found that most *nazhir* lack exposure to contemporary financial concepts such as investment diversification, microfinance, and sustainable development. As a result, *waqf* assets are often managed conservatively and underutilized.

Academic institutions have begun to introduce *waqf* literacy programs through workshops and community outreach, yet their coverage remains limited. Government campaigns, though active, have not achieved widespread behavioral change due to limited media collaboration. Respondents consistently emphasized the importance of educational integration across sectors—particularly through schools, mosques, and community networks—to foster a culture of innovation in *waqf* management. The data corroborate findings by Mukhlisin et al. (2025) that literacy and awareness are critical precursors to sustainable stakeholder collaboration in Islamic social finance.

The Pentahelix Model as a Strategic Framework

The proposed Pentahelix-based model derived from this study offers a structured approach for transforming *waqf* management through collaborative governance (Table 3). It emphasizes the distinct yet interdependent roles of each stakeholder:

- Academia contributes through research, capacity building, and innovation in *waqf* management methods.
- Government provides legal frameworks, policy direction, and institutional oversight.
- Business sector supplies funding, investment mechanisms, and technological expertise.
- Community organizations operationalize programs and manage assets on the ground.
- Media amplifies advocacy, literacy, and transparency through information dissemination.

Table 3

Recommended Pentahelix Strategies for Accelerating Productive Waqf in North Sumatra

No.	Strategic Lever	Key Actors
1	Establish a <i>Regional Waqf Synergy Forum</i> to serve as a permanent coordination hub and policy incubator.	Government, Academia, Community
2	Launch <i>Professional Nazhir Certification & Training</i> programs, including campus-based incubators.	Academia, Government, Islamic NGOs
3	Develop an <i>Integrated Digital Waqf Information System</i> for asset mapping and real-time reporting.	Government, Business, Academia
4	Introduce <i>Fiscal Incentives for Corporate Waqf</i> —e.g., tax relief, expedited licensing—to entice private capital.	Government, Business
5	Run <i>Mass Literacy & Media Campaigns</i> featuring success stories and data-driven content to shift public perception.	Media, Academia, Community

Source: Primary data.

Empirical validation from interviews and observations suggests that when these five actors collaborate, *waqf* projects become more professional, accountable, and

impactful. The model integrates principles of digital transformation, stakeholder accountability, and sustainable financing, aligning with national and global development goals. In North Sumatra, this framework can serve as a blueprint for policy innovation and institutional reform, ensuring *waqf* evolves from a charitable tradition into a strategic instrument of socio-economic empowerment.

Synthesis of Findings

Overall, the research findings reveal a multi-layered set of challenges in *waqf* management: structural inefficiency, weak collaboration, limited digitalization, and low literacy. These issues collectively hinder the transformation of *waqf* into a productive economic asset. The study's Pentahelix model addresses these challenges by promoting a holistic and participatory framework grounded in professionalization, innovation, and intersectoral synergy. By bridging the gaps between academia, business, government, community, and media, the model establishes a new paradigm of collaborative governance that redefines *waqf* as an instrument for sustainable development.

In conclusion, *waqf* management in North Sumatra remains reactive and fragmented, with limited long-term vision and policy integration. Yet, the empirical data highlight strong potential for reform through the Pentahelix approach, particularly when supported by digital infrastructure, capacity-building initiatives, and institutional alignment. This study thus provides a concrete foundation for designing policies and strategies that transform *waqf* from a symbolic religious practice into a dynamic driver of socio-economic resilience and inclusive growth in Indonesia.

DISCUSSION

Governance Reform and Institutional Capacity

The findings of this study demonstrate that *waqf* governance in North Sumatra remains constrained by weak institutional structures, lack of professionalization, and fragmented coordination among stakeholders. Most *nazhir* operate on a voluntary basis with limited financial literacy, managerial expertise, and access to technology. This has led to inefficiencies in asset management and an overemphasis on religious utilization rather than productive ventures. These results align with the study's central argument that reforming *waqf* governance requires systematic professionalization, structured regulation, and a data-driven management approach to enhance transparency and accountability. Such measures are indispensable for transforming *waqf* from a static charitable institution into an active contributor to regional development.

Empirical evidence from other Muslim-majority countries supports these findings. In Malaysia, the State Islamic Religious Councils (SIRCs) have achieved substantial improvements in accountability through the implementation of comprehensive *waqf* legislation and audit mechanisms (Ayedh et al., 2019; Kamarubahrin et al., 2019; Mahmood et al., 2017; Osman, 2012; Sulaiman et al., 2016). Turkey's centralized model under the Directorate General of Foundations similarly ensures consistent regulatory

oversight, resulting in efficient decision-making and optimized fund allocation (Akar, 2011; Jaharuddin & Muhibuddin, 2025; Mukhlisin et al., 2024; Rakhmat & Beik, 2022). Singapore's *waqf* governance reforms emphasize professional training for administrators, ensuring operational competence and ethical compliance (S. Hasan, 2011; Kunhibava et al., 2024; Listiana & Alhabshi, 2020). These comparative cases confirm that professional training, institutional standardization, and technological integration are the primary determinants of governance quality in modern *waqf* management.

Theoretically, these findings reinforce the institutionalist perspective that professional capacity and governance quality are mutually reinforcing drivers of organizational effectiveness. Practically, they imply that Indonesia's *Badan Wakaf Indonesia* (BWI) and local *nazhir* must adopt a performance-based management framework with measurable indicators of transparency and efficiency. From a policy standpoint, establishing mandatory certification and financial auditing for *nazhir* would institutionalize accountability. Furthermore, digital integration, such as blockchain-enabled fund tracking, could enhance donor confidence and regulatory oversight, aligning North Sumatra's *waqf* ecosystem with global best practices in Islamic social finance.

Collaborative Governance and the Pentahelix Framework

The results underscore that stakeholder collaboration in North Sumatra's *waqf* management remains uneven. Government and academia dominate policy and literacy efforts, while business actors, media, and community organizations contribute marginally to strategic innovation and financial mobilization. The absence of structured coordination mechanisms has limited the potential for synergistic partnerships, resulting in project-based rather than systemic collaboration. This finding validates the necessity of adopting the Pentahelix framework, which integrates the roles of government, academia, business, community, and media in a unified governance model.

Research in other contexts strongly supports this approach. Studies in Malaysia demonstrate that multi-stakeholder collaboration, particularly between academic institutions, Islamic banks, and local authorities, has enabled the creation of innovative financial instruments such as *waqf-linked sukuk* (Md Zabri & Mohammed, 2018; Suhaili et al., 2018). Similarly, Turkey's participatory approach in *waqf* governance integrates community organizations and civil society into project design and implementation, enhancing local relevance and accountability (Zawawi et al., 2023). In Indonesia, the successful integration of cash *waqf* and *e-waqf* initiatives illustrates how the Pentahelix structure facilitates cross-sectoral coordination and scalability (Maulina et al., 2024; Wahyudi et al., 2024). These examples show that collaboration across sectors is essential to translating *waqf* potential into sustainable socio-economic outcomes.

Theoretically, these findings substantiate collaborative governance theory, which posits that multi-actor partnerships yield superior public outcomes through shared accountability and knowledge exchange. Practically, the implementation of a

Pentahelix model in North Sumatra could institutionalize synergy among stakeholders, enhance policy coherence, and improve innovation in *waqf* management. For policymakers, this implies the need to establish cross-sector coordination forums under BWI leadership, where academia drives research, the business sector supports investment, and media ensures transparency. This integrated approach would move *waqf* governance beyond fragmented efforts toward sustained, inclusive collaboration aligned with sustainable development objectives.

Digital Transformation and Transparency

This study revealed that digitalization in North Sumatra's *waqf* ecosystem remains nascent. Most institutions rely on manual reporting, lack integrated databases, and exhibit low digital literacy among administrators. While awareness of technological potential is growing, the absence of standardized digital tools hampers transparency and efficiency. These findings highlight a critical gap: without digital transformation, *waqf* management cannot achieve scalable accountability or real-time transparency necessary for donor confidence and regulatory compliance.

Evidence from global best practices confirms the transformative impact of digital integration. Blockchain technology provides immutable records of *waqf* transactions, enhancing traceability and preventing misuse (Heriyanto, 2025; Jatnika et al., 2025; Widiyanti, 2023). In Malaysia, automated reporting systems and real-time dashboards have improved data accuracy and public trust in *waqf* institutions (R. Hasan et al., 2022). Similarly, fintech-enabled *cash waqf* platforms in Indonesia and Turkey streamline transactions, reduce administrative delays, and expand participation across demographics (Kunhibava et al., 2023; Muneeza et al., 2025; Sano & Kassim, 2021). Studies further show that digital fundraising and online transparency tools significantly increase donor engagement and financial inclusion (Bonang et al., 2024; Hadi et al., 2025; Kasmon et al., 2025).

Theoretically, the findings align with innovation diffusion theory, suggesting that technological adoption in Islamic social finance requires enabling infrastructure, institutional readiness, and cultural acceptance. Practically, digitization can bridge governance gaps by automating reporting, enabling real-time monitoring, and enhancing resource mobilization. From a policy perspective, provincial and national *waqf* boards should prioritize digital infrastructure investment, mandate online disclosure standards, and train *nazhir* in financial technologies. This would not only improve operational efficiency but also align *waqf* management with Indonesia's digital economy vision and SDG frameworks for good governance.

Socio-Cultural and Educational Dimensions

The study's results show that socio-cultural perceptions and low literacy levels remain significant barriers to productive *waqf* implementation. In many communities, *waqf* is viewed primarily as an act of piety rather than a developmental instrument. Limited understanding of its economic potential has led to underutilization of *waqf* assets and minimal community engagement in productive programs. These findings reaffirm the

need for sustained educational initiatives and behavioral transformation to reframe *waqf* as both a religious and socio-economic mechanism for empowerment.

Comparative research substantiates these findings. Studies in Malaysia reveal that positive social perceptions and community awareness significantly enhance participation in *cash waqf* schemes (Ab Shatar et al., 2021). In contrast, low financial literacy correlates with limited engagement and mistrust in institutional management (Aldeen, 2021; Aldeen et al., 2022). Winarsih et al. (2019) demonstrate that integrating *waqf* education into curricula increases youth participation and awareness. Similarly, in many Islamic countries including Turkey and Qatar, public campaigns and media outreach have successfully reframed *waqf* as a tool for sustainable development rather than mere charity (Aissaoui & Takoua, 2025; Laallam et al., 2022; Uluyol et al., 2021). These comparative results emphasize that socio-cultural transformation and literacy improvement are preconditions for *waqf* modernization.

From a theoretical standpoint, the results reinforce the behavioral economics perspective, which links knowledge, trust, and participation in religious philanthropy. Practically, the findings imply that building *waqf* literacy through workshops, mosque-based education, and media campaigns can reshape public attitudes and expand donor bases. Policymakers should institutionalize *waqf* education programs and collaborate with universities and religious organizations to develop culturally relevant communication strategies. By combining education, media advocacy, and digital engagement, *waqf* institutions in North Sumatra can foster a participatory culture conducive to long-term sustainability.

Policy Integration and Sustainable Development Goals (SDGs)

This study reveals that North Sumatra's *waqf* governance is insufficiently aligned with national development agendas and global SDGs. Despite policy frameworks such as the *National Waqf Roadmap 2024–2029*, implementation remains fragmented due to weak coordination between BWI, local governments, and financial institutions. The findings indicate that *waqf* potential to contribute to poverty alleviation, education, and entrepreneurship is hindered by limited policy synchronization and absence of performance-based assessment mechanisms. Strategic policy integration is therefore vital for maximizing *waqf*'s socio-economic impact.

Empirical studies across Muslim-majority nations corroborate this conclusion. In Malaysia, *waqf* has been incorporated into national development plans, supporting SDGs related to education, health, and poverty reduction (Ascarya et al., 2022; Khan & Badjie, 2022; Umar et al., 2022). Turkey and Singapore similarly institutionalize *waqf* projects as part of broader socio-economic programs, using social impact assessments to measure effectiveness (Dirie et al., 2024; Zawawi et al., 2023). Evidence shows that *waqf* financing mechanisms such as *waqf-linked sukuk* and fintech platforms have advanced SDG-oriented initiatives globally (Qurrata et al., 2024; Umar et al., 2022). These models demonstrate that structured policy alignment enhances accountability, scalability, and community welfare outcomes.

Theoretically, these findings align with sustainable development theory, emphasizing the integration of ethical finance with public policy to achieve long-term welfare. Practically, the study suggests embedding *waqf* within Indonesia's regional development frameworks by linking funding to measurable SDG indicators, especially poverty alleviation (SDG 1), education (SDG 4), and decent work (SDG 8). Policymakers should also incentivize private sector participation through tax benefits and CSR partnerships. Implementing impact evaluation systems and multi-stakeholder oversight mechanisms would ensure accountability and policy coherence. This alignment transforms *waqf* from a religious obligation into a strategic financial instrument for inclusive and sustainable growth.

Integrative Reflection

Across these domains, governance reform, collaboration, technology, socio-cultural engagement, and policy integration, the findings collectively emphasize that effective *waqf* management requires systemic transformation grounded in professionalization, innovation, and inclusivity. The Pentahelix model offers a comprehensive governance structure capable of addressing the multi-dimensional challenges identified in this study. Comparative insights from Malaysia, Turkey, and Singapore demonstrate that countries achieving high *waqf* performance share three core attributes: standardized governance, technological adoption, and cross-sectoral collaboration.

From a theoretical perspective, the findings extend existing models of Islamic social finance by integrating collaborative governance and digital transformation within a socio-cultural framework. Practically, they highlight that empowering *nazhir*, enhancing digital transparency, and cultivating public literacy are mutually reinforcing levers for reform. Policy-wise, institutionalizing the Pentahelix model can ensure long-term sustainability and alignment with SDGs, enabling *waqf* to function as an inclusive, accountable, and development-oriented financial institution in Indonesia.

CONCLUSION

This study examined the governance and development of *waqf* in North Sumatra, revealing systemic challenges of fragmentation, low professionalization, and limited stakeholder collaboration. The findings highlight that despite North Sumatra's vast *waqf* potential, weak institutional capacity and low literacy have hindered its transformation into a productive financial instrument. The proposed Pentahelix-based model, involving academia, government, business, community, and media, offers a comprehensive approach to strengthening *waqf* governance through structured collaboration, digital transformation, and professional capacity-building. By embedding these principles, *waqf* can shift from a traditional philanthropic practice toward a sustainable driver of socio-economic empowerment.

The discussion established that institutional reform, technological integration, and socio-cultural education are mutually reinforcing dimensions of effective *waqf* governance. Comparative evidence from Malaysia, Turkey, and Singapore demonstrated that high-performing *waqf* systems rely on professional training, digital

transparency, and cross-sector partnerships. The results validate collaborative governance theory, confirming that synergy among diverse stakeholders enhances efficiency and accountability. Theoretically, this study contributes by extending the Pentahelix model into the Islamic social finance domain; practically, it provides an operational framework adaptable to Indonesia's provincial *waqf* ecosystems.

Overall, the research emphasizes *waqf*'s potential to contribute directly to Indonesia's sustainable development agenda. Aligning *waqf* management with the Sustainable Development Goals (SDGs), especially poverty alleviation, education, and economic empowerment, can transform religious endowments into strategic instruments of inclusive growth. By integrating policy reform, technological innovation, and community engagement, this study provides a roadmap for enhancing *waqf* productivity, governance integrity, and public trust. Its findings underscore the significance of the Pentahelix model as a replicable governance framework for fostering transparency, collaboration, and long-term sustainability within Islamic social finance.

Limitation of the Study

Although this study provides valuable insights into *waqf* governance and multi-stakeholder collaboration, several limitations should be acknowledged. First, the qualitative design, based primarily on interviews and document analysis, offers depth but restricts generalizability across Indonesia's diverse *waqf* contexts. The findings represent conditions specific to North Sumatra, where socio-economic structures, religious practices, and institutional capacities may differ from other regions. Second, the study's reliance on self-reported data introduces the possibility of bias, particularly when participants discuss their own institutions' performance. Additionally, access to comprehensive quantitative data, especially regarding financial outcomes and impact metrics, was limited, constraining the ability to measure productivity empirically.

The study also focused mainly on institutional and managerial aspects, with less attention to the micro-level behavior of individual donors or beneficiaries. Furthermore, while digitalization emerged as a critical factor, the research did not explore technical models or cost-benefit analyses of implementing specific digital tools in *waqf* systems. Lastly, as this study centered on developing a conceptual framework, further empirical validation through pilot programs or longitudinal data collection was beyond its scope. Despite these constraints, the results provide a strong foundation for future investigation into governance innovation and collaborative frameworks in Islamic philanthropy.

Recommendations for Future Research

Future studies should pursue mixed-method approaches that combine qualitative depth with quantitative rigor to assess the measurable impacts of *waqf* governance reforms. Longitudinal and comparative studies across provinces or countries would help evaluate the scalability and effectiveness of the proposed Pentahelix model. Researchers should also develop empirical instruments for measuring performance

indicators such as transparency, financial returns, and community welfare outcomes. Expanding the focus to include donor behavior, digital adoption rates, and intergenerational perspectives could provide a more holistic understanding of *waqf* sustainability in the digital era.

Additionally, future research should explore the integration of advanced technologies, such as blockchain, artificial intelligence, and big data analytics, into *waqf* management systems to enhance transparency and efficiency. Policy-oriented studies could examine the role of fiscal incentives, public-private partnerships, and educational interventions in promoting productive *waqf*. Finally, experimental pilot programs implementing the Pentahelix model across diverse socio-economic settings could offer empirical evidence for its practical feasibility. By addressing these areas, future research can build on the present study's foundation and contribute to the global discourse on Islamic social finance innovation and sustainable governance reform.

Author Contributions

Conceptualization	I.S.L., M.R., & M.	Resources	I.S.L., M.R., & M.
Data curation	I.S.L., M.R., & M.	Software	I.S.L., M.R., & M.
Formal analysis	I.S.L., M.R., & M.	Supervision	I.S.L., M.R., & M.
Funding acquisition	I.S.L., M.R., & M.	Validation	I.S.L., M.R., & M.
Investigation	I.S.L., M.R., & M.	Visualization	I.S.L., M.R., & M.
Methodology	I.S.L., M.R., & M.	Writing – original draft	I.S.L., M.R., & M.
Project administration	I.S.L., M.R., & M.	Writing – review & editing	I.S.L., M.R., & M.

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Informed Consent Statement

Informed consent was obtained before respondents answered the interview for this study.

Data Availability Statement

The data presented in this study are available on request from the corresponding author.

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Conflicts of Interest

The authors declare no conflicts of interest.

Declaration of Generative AI and AI-Assisted Technologies in the Writing Process

During the preparation of this work, the authors used ChatGPT, DeepL, Grammarly, and PaperPal to translate from Bahasa Indonesia into American English and improve the clarity of the language and

readability of the article. After using these tools, the authors reviewed and edited the content as needed and took full responsibility for the content of the published article.

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