IJSS: International Journal of Sharia Studies
Vol. 3 No. 2 (July-December 2025): 53-72
https://ojs.tunasinstitute.com/index.php/ijss

Blockchain-Based Zakat Management for Transparency and Poverty Alleviation in Somalia

Mohammad Musa
Yarmouk University, Somalia
Mohamed.musa@outlook.co.id

Article Info

Article history:

Received Nov 1, 2025
Accepted Jan 9, 2026
Publish Feb 6, 2026

Keywords:

Zakat,
Blockchain,
Somalia,
Transparency.

ABSTRACT

Ideally, zakat functions as a powerful instrument of social justice and poverty alleviation within Muslim communities, including in Somalia—a country with significant zakat potential and urgent socioeconomic needs. In reality, however, weak governance structures, limited transparency, fragile institutions, and low public trust continue to hinder effective zakat management. This situation reflects a gap between the normative aspiration of zakat as a pillar of communal welfare and the suboptimal implementation observed on the ground. This study aims to explore a blockchain-based zakat management model as an innovative approach to enhance transparency, accountability, and distribution efficiency in Somalia. Using a library-based method and a qualitative-descriptive approach, this research examines academic literature, international institutional reports, and publications related to blockchain technology and zakat governance. The findings demonstrate that blockchain enables transparent transaction recording, smart-contract mechanisms for targeted disbursement, and increased public trust in zakat institutions. Thus, blockchain technology holds strategic potential to establish trustworthy, inclusive, and impactful zakat governance, contributing meaningfully to poverty alleviation efforts in Somalia.

Corresponding Author:

Mohammad Musa
Yarmouk University, Somalia
Mohamed.musa@outlook.co.id

INTRODUCTION

Zakat is not merely a ritual act of charity; within the framework of Islamic economics and social development, it functions as a wealth distribution

mechanism imbued with moral values, justice, and social solidarity. Ideally, a zakat system ensures that the obligatory wealth contributed by muzakki is distributed accurately, accountably, and in a manner that sustainably promotes the welfare of mustahiq. However, in the era of economic globalization and digital transformation, governance challenges have become increasingly complex. The demand for transparent reporting, verifiable transaction trails, and efficient as well as inclusive distribution systems has emerged as a central concern. In this context, technologies such as blockchain have gained attention as innovative responses, offering decentralized, immutable, and publicly auditable ledgers that have the potential to address longstanding limitations in traditional zakat fund management.

The Somali context, in particular, reflects profound structural vulnerabilities. Official data indicate that approximately 54.4% of the population lives below the national poverty line, based on consumption of less than USD 2.06 per day (Somalia Poverty Report, 2023). Furthermore, the national Multidimensional Poverty Index reveals that around 67% of Somalia's population experiences multidimensional poverty, including limited access to clean water, sanitation, education, and healthcare (Somalia Launched Its First Multidimensional Poverty Index Report, n.d.). This situation is further exacerbated by the disproportionately high poverty rates among nomadic populations, exceeding 80% in several regions (MPPN, 2025). Amid persistent poverty and institutional fragility, zakat serves as a critical instrument for socio-economic recovery, particularly given the limited capacity of state institutions and formal welfare systems to reach the entire population.

Ideally, zakat management operates on the principles of amanah (trustworthiness), transparency, and accountability, encompassing open and verifiable processes of collection, recording, distribution, and reporting. Nevertheless, the reality in Somalia reveals significant gaps. Zakat distribution is often poorly documented, beneficiary (mustahiq) verification is not consistently conducted through reliable systems, and public reporting remains minimal. Under such conditions, the risks of fund misappropriation, beneficiary duplication, and misallocation are considerably high. Even when zakat funds are successfully collected, their effectiveness in improving the welfare of mustahiq remains limited due to untargeted or untimely distribution.

This situation underscores the importance of the present study, which examines how a blockchain-based system can be applied to zakat management in Somalia to address issues of transparency, accountability, and effectiveness, while remaining aligned with Islamic values and social justice principles. Technology should not be perceived as an instant solution; however, when adapted to local contexts—including infrastructure constraints, community culture, and institutional structures—it can evolve into an empowering tool. Accordingly, this study aims to develop a blockchain-based zakat management model that is responsive to Somalia's humanitarian and economic crisis.

Specifically, the objectives of this research are: (1) to analyze the potential application of blockchain technology in zakat management in Somalia to enhance transparency and accountability; (2) to design an operational model for blockchain-based zakat management incorporating smart contracts, a public-permissioned ledger, and an adaptive beneficiary verification system; and (3) to evaluate the contribution of such a system to poverty alleviation, particularly by linking improved zakat governance with mustahiq welfare outcomes, including income enhancement, access to basic services, and vulnerability reduction.

The contribution of this study is twofold: theoretically, it enriches the literature on Islamic economics and financial technology by providing insights from a fragile-state context; practically, it offers a blueprint for zakat institutions, governments, and donors to strengthen zakat governance in Somalia through humane and context-sensitive digital technology. Through this approach, zakat is expected to transcend its role as a mere flow of collected and distributed funds, evolving instead into a socio-economic provision that enhances the dignity of recipients, empowers communities, and fosters public trust in Islamic social finance systems amid the challenges of poverty and institutional fragility.

LITERATURE REVIEW

The discussion on integrating blockchain technology into zakat management is not new within contemporary academic discourse. Sabil Mokodenseho and colleagues, in their article *"Utilizing Blockchain Technology to Increase Transparency in Zakat Management,"* argue that blockchain can strengthen public trust through immutable, transparent, and decentralized record-keeping systems. Their study demonstrates how blockchain technology can reduce moral hazard and enhance the legitimacy of zakat institutions, particularly in urban areas with adequate digital infrastructure (Mokodenseho et al., 2023). These findings align with the present study in positioning transparency as a central pillar of effective zakat governance. Nevertheless, Mokodenseho et al. primarily focus on institutional readiness within relatively stable systems, whereas this study departs from the Somali reality—marked by limited digital infrastructure, political complexity, and social fragmentation—which demands a more contextual, human-centered, and community-based approach.

Similarly, Andrew Dahdal et al., in *"The Role and Potential of Blockchain Technology in Islamic Finance,"* examine blockchain from a legal perspective and assess its compatibility with Sharia principles in Islamic financial systems. Their study highlights blockchain's capacity to reinforce core Sharia values such as amanah (trust), justice, transaction traceability, and the prevention of gharar, while also addressing cross-border legal challenges (Dahdal et al., 2022). The relevance of this work to the present research lies in its emphasis on Sharia principles as a normative framework. However, a fundamental distinction exists in the object of analysis: Dahdal et al. focus on macro-level financial regulation and international Islamic finance, whereas this study situates blockchain within a

social mission aimed at empowering mustahiq, restoring public trust, and uplifting vulnerable communities from systemic poverty in Somalia.

Adam Ahmed Hussein, in his article *"The Role of Zakat in Poverty Alleviation in Somalia,"* underscores the significance of zakat as a social instrument in a country affected by prolonged crisis, political conflict, and economic instability. Hussein identifies structural barriers—such as weak formal institutions, the dominance of kinship networks, and the absence of robust audit mechanisms—as major obstacles to effective zakat distribution in Somalia (Hussein, 2017). This study shares a common point of departure with Hussein's work, namely chronic poverty and fragile public trust. However, Hussein's analysis remains largely diagnostic and normative, calling for stronger zakat institutions without offering operational solutions. In contrast, the present study advances the discussion by proposing a technology-based operational model that accounts for undocumented populations, local religious networks, and the Somali diaspora, with an explicit orientation toward social reconstruction and distribution efficiency through blockchain.

Furthermore, Alea Syaffa Mohd Sabri and colleagues, in *"The Future of Zakat in the Blockchain Era,"* map the opportunities presented by blockchain for modernizing zakat management, particularly in terms of automation, auditability, and Sharia compliance. They emphasize the importance of digital literacy and institutional readiness for successful technological implementation (Sabri et al., 2025). While their work aligns with this study in highlighting ecosystem readiness and education, it pays limited attention to contexts of extreme social vulnerability, such as multidimensional poverty, displacement, and economic informality—conditions that dominate the Somali landscape. This research seeks to address these realities by proposing a model that is not merely technical, but also spiritual, social, and humanistic.

Based on the foregoing review, existing studies provide a strong theoretical foundation but leave a critical gap: how can blockchain be practically implemented within fragile socio-economic ecosystems characterized by limited infrastructure and rich communal cultures, such as Somalia? Much of the existing literature emphasizes system readiness, yet it has not sufficiently addressed how technology can function as an empowerment tool in contexts marked by weak national identity systems, the dominance of clan structures and religious authority, limited internet access and digital literacy, and the urgent need to restore the social dignity of mustahiq through empowerment rather than mere fund distribution.

This study seeks to fill this gap by offering a techno-empirical model based on zakat smart contracts, community-based identity verification, mosque-based blockchain nodes, and simple digital wallets capable of operating in offline–sync modes. The model is oriented not only toward efficient zakat distribution but also toward the creation of a just, trustworthy, and humane social ecosystem. In doing so, this research bridges the divide between technological idealism and the lived realities of communities most in need of justice—those who are not only

materially poor but also deeply affected by social uncertainty and structural injustice.

RESEARCH METHODOLOGY

This study employs a library research design with a qualitative–descriptive approach, deliberately chosen to achieve an in-depth understanding of social realities, zakat governance challenges, and the opportunities for technological transformation within a fragile-state context such as Somalia. Rather than relying solely on statistical data, this research seeks to capture the dynamics of values, public trust, and the spirit of empowerment embedded in the concept of zakat. This approach enables a comprehensive exploration of ideas, empirical experiences, and digital innovations that may shape a more humane, transparent, and mustahiq-oriented zakat system in the future.

The primary sources of this study consist of peer-reviewed academic journal articles, official reports related to Islamic economics, blockchain studies, and regulatory documents as well as best practices in contemporary zakat governance, including cases from countries with high levels of institutional vulnerability. Secondary sources include scholarly books, reports from international organizations—such as UNDP, the World Bank, and the OECD—Somalia's poverty statistics, and policy publications on Islamic financial technology. Data analysis is conducted through content analysis and critical thematic reading, ensuring that the collected information is not merely compiled but also interpreted within its broader social context and underlying humanitarian values. The validity of the findings is strengthened through triangulation of theoretical perspectives, empirical evidence, and Sharia principles, particularly the values of amanah (trustworthiness), justice, and transparency.

RESULTS AND DISCUSSION

Socio-Economic Conditions of Somalia and Challenges in Zakat Distribution

As a nation striving to recover from the impacts of prolonged conflict, widespread poverty, and deep structural vulnerability, Somalia presents a highly challenging socio-economic reality. Recent data indicate that approximately 54.4% of Somalia's population lives below the national poverty line, defined as consumption of less than the equivalent of USD 2.06 per day (admin, 2023). This pervasive poverty is not merely a matter of low income, but also reflects limited access to basic services such as education, healthcare, and social protection. Accordingly, discussions on zakat management in the Somali context must be understood as an essential component of broader efforts to strengthen collective welfare and promote social justice.

From a macroeconomic perspective, Somalia's economic growth remains constrained. Despite some progress in macroeconomic stabilization and regional integration, real gross domestic product (GDP) growth averages only around 2.4%

per year, while per capita growth has declined (Overview, n.d.). Under such conditions, many households are confined to the informal sector, which lacks adequate social protection and is highly exposed to external shocks such as droughts, conflict, and fluctuations in food prices.

The informal sector constitutes the backbone of economic life for a large proportion of Somalia's population. Studies suggest that Somalia's informal economy is closely linked to remittances from the diaspora, which in some estimates contribute up to one-third of GDP (The Challenge of Informality, n.d.). While this informal system sustains household livelihoods, it also poses significant challenges in terms of regulation, access to formal financial services, and transparency of financial flows. In the context of zakat management, this implies that zakat collection and distribution mechanisms must account for the informal and geographically dispersed nature of the national economy.

Furthermore, Somalia's formal institutions suffer from profound weaknesses. A fragile legal system, inconsistent contract enforcement, and limited regulatory capacity generate uncertainty for economic actors and civil society alike (Opaque Operations, n.d.-a). The capacity of public institutions, including those responsible for poverty alleviation and social assistance, remains fragmented and vulnerable to corruption, resource diversion, or failures in targeted distribution. These institutional weaknesses represent a key reason why aid and zakat do not consistently reach the most vulnerable groups in an efficient and equitable manner (Owino, 2020).

External vulnerabilities further intensify Somalia's socio-economic challenges. The country is systematically exposed to prolonged droughts, climate change impacts, and internal conflict, all of which contribute to population displacement and heightened fragility (Islamic Finance, n.d.-a). For instance, nomadic populations and communities in remote areas experience extremely high levels of multidimensional poverty, exceeding 80% in certain regions. These conditions underscore the need for zakat distribution mechanisms that are adaptive to vulnerability, rather than focused solely on nominal financial transfers.

Within the framework of zakat management, zakat institutions play a critical socio-economic role in a country such as Somalia, where formal welfare systems remain underdeveloped. As a redistributive instrument, zakat holds significant potential to bridge communal resources with the concrete needs of impoverished populations (Kidwai, 2021). However, this potential can only be realized if zakat distribution is managed in a transparent, accountable, and locally adaptive manner (Owino, 2020). In Somalia, structural challenges such as economic informality and institutional fragility constitute major obstacles to effective zakat governance.

Effective zakat distribution in Somalia requires contextual understanding—namely, identifying who the poor are, how poverty is experienced, where vulnerable populations are located, and how they access essential services. Multidimensional poverty studies reveal that approximately

67% of Somalia's population lives in multidimensional poverty, including deprivations in access to clean water, sanitation, education, and healthcare (Somalia Launches Official National Multidimensional Poverty Index: Two Thirds of People in Somalia Are Poor, n.d.). Consequently, zakat management in Somalia cannot be limited to cash transfers or trade assistance alone, but must be oriented toward addressing multiple dimensions of deprivation.

A fundamental issue lies in the persistent challenges of transparency and accountability faced by zakat and humanitarian institutions (Khan, 2024). In the Somali context, several reports indicate that humanitarian assistance is frequently misused or diverted to unintended recipients (Opaque Operations, n.d.-b). This demonstrates that without robust mechanisms for beneficiary verification, fund tracking, and meaningful community engagement, zakat programs may fail to achieve their intended outcomes or may even reinforce existing inequalities.

Moreover, the dominance of the informal economy further complicates zakat targeting. Many potential zakat beneficiaries operate within informal sectors without official records or experience frequent displacement due to conflict or drought. Evidence shows that internally displaced persons (IDPs) face a significantly higher risk of poverty compared to the general population (Differences in Household Composition, n.d.). Therefore, zakat distribution mechanisms must be flexible, responsive, and supported by inclusive and accurate identification systems.

The integration of zakat approaches with formal social assistance systems also warrants consideration. In fragile-state contexts such as Somalia, zakat can form part of a broader social development strategy that not only delivers short-term relief but also strengthens local capacities, economic empowerment, and social institutions. Accordingly, zakat management should be supported by systematic monitoring and evaluation, open reporting, and the strategic use of technology to facilitate transparency and accountability (Beik et al., 2021). Nevertheless, weaknesses in zakat distribution systems should not be viewed merely as operational failures, but rather as reflections of deeper structural challenges—namely high levels of economic informality, fragile institutions, and an environment highly exposed to external shocks.

Therefore, recommendations for strengthening zakat management in Somalia must acknowledge this complexity and adopt context-sensitive and adaptive approaches. Enhancing the capacity of zakat institutions, developing robust data infrastructure, and fostering synergy with local communities constitute essential elements of an effective and sustainable zakat governance strategy.

Dynamics of Zakat Management in Somalia: Issues of Accountability and Public Trust

In many Muslim societies, zakat management is often regarded as a moral bridge between those who possess resources and those in need (Ikhwandha &

Hudayati, n.d.). In fragile states such as Somalia—where prolonged conflict, economic vulnerability, and weak public institutions shape a highly precarious social landscape—the role of zakat institutions becomes increasingly critical. Nevertheless, this noble potential is frequently undermined by practical constraints that erode public trust and challenge accountability. This situation raises a fundamental question: how can zakat institutions function as effective agents of social change when the foundation of public trust remains fragile?

At the operational level, zakat collection institutions in Somalia face structural challenges that cannot be overlooked. Many operate in conflict-affected zones or areas with limited access due to population displacement, recurrent droughts, and insecurity. Under such conditions, mechanisms for beneficiary verification, distribution reporting, and internal auditing often lag behind urgent humanitarian needs. As a result, even when zakat funds are successfully collected, their management and distribution may lose traceability, ultimately damaging public perceptions of institutional reliability.

Public trust constitutes a core component of zakat governance systems. When communities are not confident that zakat funds will be distributed appropriately, they tend to bypass formal institutions and instead channel zakat directly to family members, neighbors, or local communities. Evidence from Indonesia indicates that the accountability of zakat institutions significantly influences both the cognitive and affective trust of muzakki (zakat payers) (Juniati & Widiastuti, 2024). Although the contexts differ, these findings are relevant for understanding Somalia's "trust deficit": when institutional accountability is questioned, public willingness to engage with formal zakat institutions diminishes.

Transparency in zakat management is frequently cited as a primary solution; however, in practice, it is often insufficient on its own. Research suggests that transparency alone does not automatically generate public trust, which is more strongly shaped by tangible accountability and concrete mechanisms of responsibility (Ikhwandha & Hudayati, n.d.). In Somalia, where socio-economic data are limited and formal institutions remain underdeveloped, public transparency poses significant challenges. Open financial reporting alone is inadequate if communities doubt institutional integrity or the fairness of distribution processes.

The zakat collection ecosystem in Somalia is also deeply influenced by informality and local community structures. A substantial proportion of zakat is paid through community channels, mosques, or extended family networks, as formal institutions are either insufficiently trusted or unable to reach remote areas. Meanwhile, formal zakat institutions attempting to expand their reach encounter severe constraints, including weak infrastructure, limited managerial capacity, and difficult operating environments. This combination creates a persistent gap between zakat's potential as a systemic redistributive instrument and the fragmented reality of its distribution.

On the distribution side, accountability challenges become particularly visible: questions regarding who receives zakat, how much is disbursed, and what outcomes are achieved often remain unanswered or poorly documented. In fragile contexts such as Somalia, internally displaced persons (IDPs), female-headed households, and remote communities are frequently among the most vulnerable yet the hardest to track. In the absence of transparent accountability systems and clear outcome measurement, perceptions that zakat funds are "lost" or "misallocated" tend to emerge, further undermining public trust in zakat institutions.

Moreover, cultural and socio-local factors play a crucial role in shaping these dynamics. Clan structures, social networks, and communal bonds are deeply embedded in Somali society. Consequently, zakat distribution cannot be treated solely as a financial transaction but must be understood as a social process that requires local legitimacy. When formal zakat institutions overlook local wisdom and fail to establish partnerships with communities, they risk being perceived as external or disconnected actors, thereby inhibiting the development of public trust. Inclusive approaches that actively involve local communities, religious leaders, and zakat beneficiaries are therefore essential to strengthening accountability.

The integration of technology has also emerged as a prominent theme in the literature. Digital systems, fund-tracking mechanisms, and blockchain are frequently proposed as tools to enhance transparency and accountability in zakat management (Hassan et al., 2022). However, in Somalia, infrastructural constraints, limited digital literacy, and restricted internet access remain significant barriers. Accordingly, technological solutions must be combined with local capacity-building and contextual adaptation, rather than merely importing models from developed countries without modification. Any proposed technological framework must account for on-the-ground realities such as security conditions, beneficiary mobility, and community communication networks.

These phenomena open space for interdisciplinary inquiry at the intersection of zakat studies, social finance management, development sociology, and fragile state studies. For instance, research on "Economic Inequality and Islamic Charity" using agent-based modeling demonstrates that religiously motivated donations can systematically influence wealth distribution within societies (Sabzian et al., 2018). In the Somali context, such academic approaches can be translated into analyses of how zakat management may strengthen social redistribution systems under conditions of institutional weakness.

To enhance public trust and reinforce accountability in zakat management in Somalia, several strategic measures can be proposed: (1) strengthening national regulatory frameworks governing zakat management; (2) developing credible beneficiary information systems; (3) ensuring regular, accessible public reporting; (4) conducting independent audits and involving beneficiary

communities in program evaluation; and (5) leveraging technology in ways that are sensitive to local conditions. These recommendations are consistent with findings from "The Importance of Accountability in Zakat Institutions," which emphasize that zakat institutions must provide clear financial and operational reporting to improve public perception and trust (Rejab et al., 2023).

Blockchain Technology in Islamic Financial Systems: Concepts, Principles, and Its Relevance to Zakat

In the increasingly advanced digital era, Islamic finance faces both significant challenges and opportunities, particularly in maintaining integrity, justice, and accountability within financial transactions that are rapid and widely distributed. Blockchain technology has emerged as a key innovation capable of transforming the paradigm of financial management, including zakat, waqf, and Islamic philanthropy (Hamdani, 2020). With its decentralized, immutable, and publicly accessible ledger characteristics, blockchain offers a new model for recording, verifying, and distributing religious funds in a more transparent and efficient manner. Recent studies indicate that this technology holds substantial potential within Islamic financial systems, as it aligns with Sharia principles such as amanah (trustworthiness), transparency, and the avoidance of gharar (uncertainty) (Dahdal et al., 2022).

To begin, it is essential to briefly understand the fundamental concept of blockchain. Technically, blockchain is a sequence of data blocks cryptographically linked, in which each transaction is recorded by a peer-to-peer network, validated through consensus mechanisms, and subsequently becomes a permanent part of the ledger. Its core characteristics include decentralization (the absence of a single controlling authority), immutability (resistance to alteration or deletion), and transparency (the traceability of transaction histories). Within the context of Islamic finance, these features can help address long-standing challenges such as fragmented records, low institutional trust, and audit difficulties commonly faced by zakat institutions. For instance, prior research highlights that blockchain enables "real-time visibility" of zakat transactions, a capability that was previously difficult to achieve (Mokodenseho et al., 2023).

When comparing blockchain characteristics with the principles of Islamic finance, several notable alignments emerge, forming the basis for arguments supporting integration. The principle of amanah, whereby zakat administrators are entrusted with funds from muzakki, closely corresponds with blockchain's ability to facilitate public records and independent verification. Likewise, the principle of transparency—central to Islamic financial ethics—requires that the utilization of public religious funds such as zakat be accountable to both muzakki and mustahiq. Through its open ledger structure, blockchain can provide immutable audit trails. Indeed, studies suggest that blockchain "aligns closely with the ethical framework of Islamic finance due to its transparency, immutability, and decentralized nature" (Islamic DeFi, 2025).

Furthermore, the avoidance of gharar and maysir (excessive uncertainty and speculation) constitutes a critical evaluative dimension. Islamic finance strictly prohibits transactions characterized by ambiguity, excessive speculation, or informational manipulation. Blockchain technology can mitigate elements of gharar by providing clear records of transaction entities, fund flows, and beneficiary status. A study by Dahdal et al. (2022) notes that blockchain in Islamic finance "ensures traceability in contracts," thereby reducing uncertainty and enhancing contractual clarity.

Nevertheless, this compatibility is not without challenges. From both Sharia and operational perspectives, critical questions remain regarding whether all blockchain implementations are genuinely free from riba (interest), speculation, and inconsistent practices that may undermine the Islamic principle of justice ('adl). Some scholars caution that despite its efficiency and transparency, blockchain applications may also "open the door for tax evasion and money laundering," underscoring the necessity of robust regulation and governance frameworks (Ayodeji, 2024).

In practical terms, however, the integration of blockchain technology into zakat management presents promising opportunities. Smart contract systems, for example, can be programmed to automatically execute zakat rules: once a muzakki makes a payment, the system records, verifies, and distributes funds to mustahiq according to predefined and Sharia-approved criteria (Rejab et al., 2023). Empirical evidence from several countries demonstrates that blockchain-based zakat applications can enhance efficiency and strengthen public trust (Islamic Finance, n.d.-b).

Beyond financial flows, blockchain integration in zakat management also encompasses beneficiary data management, recipient reporting, and public auditing. Through open ledgers, muzakki can directly track where their zakat funds are allocated, identify recipients, and verify distribution timelines (Khairi et al., 2023). This mechanism enhances participatory trust and reframes zakat not merely as a monetary transaction, but as a collective social responsibility. In fragile-state contexts such as Somalia—where fiduciary trust and beneficiary screening are particularly challenging—such technology has the potential to serve as a transformative instrument.

Despite its promise, these opportunities must be approached realistically. Field-level implementation faces significant obstacles, including limited digital infrastructure, low technological literacy, uneven internet access, and Sharia as well as legal frameworks that have yet to fully accommodate emerging technologies. Accordingly, blockchain integration within Islamic financial systems, particularly zakat, should be understood as an effort to reconstruct redistributive mechanisms on a more accountable technological foundation.

From an academic perspective, this development opens broad avenues for interdisciplinary research spanning fiqh muamalat, Islamic fintech, governance, and social development. Recent scholarship highlights "decentralized solutions for Shariah-compliant finance" as a future framework for Islamic financial systems

(Alsadi, 2025). Consequently, blockchain-based zakat implementation in Somalia must be context-sensitive, potentially adopting hybrid models that combine local community institutions—such as mosques and customary leaders—with ledger technology, alongside minimal yet effective regulations ensuring data interoperability across institutions. Technology alone is insufficient; it must be supported by a culture of trust, local capacity building, and institutional structures adaptable to socio-cultural realities.

Normatively, zakat institutions and Islamic regulators should consider several technological design elements to ensure Sharia compliance: (1) guaranteeing payment mechanisms free from riba and speculation; (2) clearly defining mustahiq eligibility criteria within smart contracts; (3) incorporating independent audits and verification processes recorded on the ledger; and (4) maintaining inclusive technological access to prevent digital divides between urban and rural beneficiaries. When properly implemented, such integrative models can reinforce amanah and justice within the zakat ecosystem.

Model of Blockchain Implementation in Zakat Management in Somalia

The implementation of blockchain for zakat management in Somalia requires an approach that extends beyond technological considerations and remains sensitive to the country's fragile social, cultural, and institutional conditions. Given the low level of public trust in formal institutions and the dominance of religion-based social networks, an effective implementation model must integrate digital structures with religious legitimacy and community engagement. Accordingly, a centralized system—commonly applied in developed countries—is less suitable. Instead, a hybrid architecture involving zakat institutions, major mosques, trusted NGOs, and local religious leaders is more appropriate. This approach aligns with global zakat governance models that emphasize the integration of community actors with decentralized technologies.

Operationally, the process may begin with the establishment of a Zakat Digital Governance Hub, functioning as a central node for Sharia verification, auditing, and mustahiq registration. Blockchain nodes would not be confined to a central authority but distributed across mosques, Islamic universities, and Somali diaspora networks. This configuration promotes distributed trust in line with blockchain logic, thereby reducing the risk of misuse by a single actor. Such an approach is consistent with the concept of trust decentralization in Islamic finance, which has gained prominence in global Sharia fintech literature (Dahdal et al., 2022).

The core component of this system lies in the use of zakat smart contracts, which are automated digital protocols designed to execute Sharia rules without direct human intervention. Once a muzakki disburses zakat, the system automatically allocates funds according to asnaf regulations, distribution timelines, and program priorities. Smart contracts also restrict fund usage exclusively to Sharia-compliant activities. Similar models have been examined as

standards for transparent, automated zakat distribution within futuristic Islamic financial systems (Ayodeji, 2024).

Blockchain provides a permanent and transparent ledger that records zakat payments, mustahiq verification, and distribution trails. To safeguard privacy, a public-permissioned blockchain model may be employed: aggregate data—such as total distributions and recipient regions—remain publicly accessible, while mustahiq identities are encrypted and accessible only to authorized entities (Zulfikri et al., 2021). This approach ensures accountability without compromising privacy, consistent with maqasid al-shariah principles that emphasize the protection of dignity and the prevention of data exploitation (Islamic DeFi, 2025).

Monitoring of beneficiaries can be conducted through Sharia-compliant digital wallets, either via mobile applications or NFC cards for areas with limited smartphone penetration. Beneficiary status updates occur automatically in response to changes in economic conditions. When a mustahiq achieves financial independence, the system removes them from the recipient list through a humane process, ensuring that zakat functions as a tool for empowerment rather than dependency. This model reflects data-driven progressive zakat practices emerging in other Muslim-majority countries (Islamic Finance, n.d.-a).

Through this architecture, a new zakat trust cycle is established: muzakki can monitor the impact of their contributions, institutions can demonstrate distribution accountability, and mustahiq receive timely, targeted, and dignified assistance. Blockchain-based socio-economic dashboards allow the public to observe empowerment indicators, such as increases in household income among mustahiq families or the number of recipients transitioning into muzakki. This mechanism reinforces the ethos of justice and social empowerment in zakat, as emphasized in recent digital zakat studies (Mokodenseho et al., 2023).

Given Somalia's limited internet infrastructure, the system must support offline verification and periodic data synchronization. This approach has proven effective in blockchain-based humanitarian programs—such as those implemented by the World Food Programme in conflict zones—enabling aid distribution despite unstable connectivity. Such a model is highly relevant to Somalia, which faces comparable challenges in digital infrastructure and social security.

Implementation execution requires support from global institutions such as the Islamic Development Bank and the UNDP Islamic Finance Lab, which actively promote the digitalization of Islamic philanthropy. Somalia may adopt a Sharia regulatory sandbox, providing a controlled policy experimentation space that enables innovation without risking violations of Sharia or national regulations. This approach has successfully accelerated fintech innovation in countries such as Malaysia and the United Arab Emirates (Alsadi, 2025).

Ultimately, successful implementation depends not only on technology but also on social competence and community digital literacy. Educational initiatives targeting imams, teachers, mosque youth, and the Somali diaspora are

critical. Religious leaders function as trust bridges between the community and digital systems. Somalia's historical experience demonstrates that social legitimacy is more effectively established through spiritual authority than through formal institutions alone.

Beyond fund distribution, the system should incorporate social mentoring and economic capacity-building programs. Zakat allocation should address basic needs, vocational education, microenterprise capital, and business mentoring. Smart contracts may automatically allocate portions of zakat funds for mustahiq training, ensuring that zakat transcends consumptive assistance and fosters sustainable economic independence.

This model opens extensive research opportunities, including digital fiqh muamalat, Islamic digital identity, Sharia-compliant smart contracts, zakat impact measurement systems, and artificial intelligence ethics in Islamic philanthropy. These directions align with global research trends positioning blockchain as a new phase in Islamic socio-economic transformation. Consequently, blockchain implementation in zakat management in Somalia represents not merely a technological innovation but a renewal of ummah governance—offering a system that is more trustworthy, transparent, inclusive, and aligned with Islamic moral values. Zakat thus becomes not only a mechanism of fund allocation, but a means of social healing, dignity reconstruction, and post-conflict economic revival.

The Impact of Blockchain on the Effectiveness of Zakat Distribution and Poverty Alleviation Efforts in Somalia

The adoption of blockchain technology in zakat management systems opens new pathways toward more effective and impactful distribution. When zakat funds are no longer merely collected and disbursed through conventional mechanisms, but instead recorded in real time, transparently, and with full audit traceability, opportunities to enhance operational efficiency become tangible. A recent study suggests that blockchain-based zakat collection systems can "eradicate extreme poverty and boost shared prosperity," as transactions are recorded in a manner that minimizes opportunities for manipulation (Khairi et al., 2023). In the Somali context—where many zakat beneficiaries reside in conflict-affected areas, informal economies, and weak institutional environments—such efficiency is critical to ensuring that funds reach recipients more quickly, accurately, and at lower operational costs.

Operational efficiency extends beyond speed and cost reduction to include transparency in distribution, which ultimately strengthens trust among muzakki and the broader public. Blockchain technology enables muzakki to trace the flow of their contributions and openly observe distribution outcomes. The study "ZakatTech & Crypto-Philanthropy" notes that each zakat transaction recorded on a blockchain is visible across the network, allowing for real-time auditing of fund flows (Kidwai, 2021). In Somalia—characterized by informality

and low accountability—such capabilities can enhance the legitimacy of zakat institutions and encourage greater participation from donors.

Accountability lies at the core of the transformation introduced by blockchain. With immutable ledgers and verifiable records accessible to authorized stakeholders, zakat institutions become systemically accountable. Empirical research indicates that blockchain adoption is significantly associated with increased perceptions of transparency within zakat institutions (Mokodenseho et al., 2023). In Somalia, where zakat institutions are often criticized for unclear distribution processes or inadequate beneficiary verification, blockchain-based accountability mechanisms offer a pathway to reverse negative public perceptions.

Misuse of zakat funds—ranging from improper allocation and ineligible recipients to internal misappropriation—remains one of the major barriers to effective poverty alleviation. Blockchain offers concrete technical solutions, such as smart contracts that predefine distribution quotas, enforce mustahiq verification, and establish automated conditions that must be met before funds are released. Analytical studies indicate that such systems can significantly reduce manipulation and distribution delays (Blockchain-Based Zakat Collection to Overcome the Trust Issues of Zakat Payers, n.d.). In Somalia, these mechanisms could substantially minimize fund leakage and ensure that zakat reaches its intended beneficiaries.

The impact on mustahiq welfare is particularly significant. When zakat distribution becomes more accurate, timely, and transparent, eligible recipients can be empowered more rapidly. Blockchain-based zakat management models facilitate not only one-time fund transfers but also continuous outcome monitoring and sustainability tracking. Beneficiaries who experience economic improvement can be identified and gradually transitioned out of the mustahiq category. The study "The Development and Application of the Zakat Collection Blockchain System" demonstrates that such systems have the potential to enhance shared prosperity within communities (Khairi et al., 2023). Given Somalia's high levels of multidimensional poverty, these effects are strategically important.

Improved distribution efficiency also implies reduced administrative and bureaucratic costs that often burden zakat institutions. Reports from The Edge highlight that blockchain-based zakat applications in Malaysia have improved efficiency by reducing regulatory, monitoring, and manual audit burdens (Islamic Finance, n.d.-a). Lower overhead costs allow a larger proportion of zakat funds to be directly allocated to mustahiq. In Somalia—where logistical and operational costs are elevated due to security challenges and limited access—such cost reductions are particularly consequential.

Nevertheless, the realization of these impacts is not automatic. Several enabling conditions must be met for blockchain technology to deliver tangible effectiveness. A critical assessment of blockchain applications in zakat literature emphasizes institutional readiness, public literacy, and regulatory frameworks as

major constraints. In Somalia, challenges related to digital infrastructure, security stability, and zakat governance regulation must be addressed to ensure that blockchain implementation moves beyond conceptual discourse toward practical impact.

When zakat distribution operates more effectively, its outcomes are reflected in broader social welfare indicators, including increased recipient income, improved access to basic services, and reduced dependence on long-term aid. Blockchain-based zakat research underscores that transparent and accountable systems support more equitable wealth redistribution. For Somalia, these outcomes may contribute to post-conflict economic recovery, as well-managed zakat can strengthen local capacity and expand economic opportunities for marginalized groups.

Furthermore, the impact of blockchain should be viewed as part of a broader transformation of the zakat ecosystem—from an altruistic donation culture toward an impact-oriented, measurable, and sustainable system. Blockchain enables zakat institutions to shift from a "fund transfer" paradigm to a measurable poverty alleviation framework. Review studies suggest that integrating Sharia-compliant fintech with zakat creates opportunities for more precise impact measurement (Beik et al., 2021).

In the Somali context, it is essential for zakat institutions to establish clear outcome indicators, such as the percentage of beneficiaries transitioning out of asnaf status within a defined period, the number of recipients securing employment or microenterprise opportunities after receiving zakat, or reductions in basic consumption vulnerability. Blockchain technology facilitates the automatic recording and reporting of these indicators, enhancing institutional learning and informing policy decisions.

Beyond efficiency and accountability, blockchain-based zakat management carries a broader humanitarian significance. It reinforces the dignity of zakat recipients through transparent and respectful processes, positioning them not merely as aid recipients but as partners in empowerment. When muzakki can observe tangible outcomes of their contributions and mustahiq experience meaningful improvements in their lives, public trust and social solidarity are strengthened. Technology thus becomes an instrument of social cohesion within a religious mission.

In sum, blockchain technology holds substantial potential to enhance efficiency, accountability, reduce fund misuse, and improve mustahiq welfare in Somalia. However, success depends not merely on technological adoption, but on institutional preparedness, supportive regulation, public literacy, and a clear results-oriented framework. When these elements are aligned, zakat can evolve beyond a religious solidarity instrument into a structural force for poverty alleviation and sustainable social development in Somalia.

Conclusion

This study affirms that zakat management in Somalia is at a critical juncture. While zakat holds substantial potential as an instrument of social justice and economic recovery, its effectiveness is constrained by structural challenges, including weak accountability, limited transparency, inadequate institutional capacity, and low levels of public trust. Conditions of extreme poverty, institutional fragility, and underdeveloped reporting systems indicate that traditional zakat management models have not been sufficient to address the complex needs of communities living in fragile contexts. Therefore, innovation in zakat governance is no longer an optional agenda but a strategic necessity to ensure that zakat functions as a genuine empowerment mechanism rather than merely a form of short-term charitable distribution.

The integration of blockchain technology into zakat management systems offers a compelling and relevant response to these challenges. Grounded in the principles of transparency, immutability, auditability, and decentralized trust, blockchain provides a more equitable, verifiable, and sharia-compliant governance framework, particularly in upholding the values of amanah (trustworthiness), anti-gharar, and public accountability. Through digital record-keeping, smart contracts, and beneficiary verification mechanisms, zakat management can be directed toward ensuring accurate targeting, reducing distribution leakages, strengthening public trust, and enhancing social impact in poverty alleviation efforts. Accordingly, this study emphasizes that digital innovation should be understood as a means of reinforcing Islamic social justice values, positioning zakat as an instrument for restoring human dignity and fostering inclusive economic development in Somalia and other similarly fragile contexts.

REFERENCES

Admin. (2023, August 30). *Somalia National Bureau of Statistics (SNBS) Launches Poverty & Inequality Report -*. https://nbs.gov.so/somalia-national-bureau-of-statistics-snbs-launches-poverty-inequality-report/

Alsadi, N. (2025). *The Convergence of Blockchain Technology and Islamic Economics: Decentralized Solutions for Shariah-Compliant Finance* (No. arXiv:2501.02263). arXiv. https://doi.org/10.48550/arXiv.2501.02263

Ayodeji, A. K. (2024). *Blockchain Technology in Islamic Finance: Fit for Purpose or a Mere Replication* (SSRN Scholarly Paper No. 4861293). Social Science Research Network. https://doi.org/10.2139/ssrn.4861293

Beik, I. S., Zaenal, M. H., & Saoqi, A. A. Y. (2021). The Optimization of Blockchain for Greater Transparency in Zakat Management. *Springer Books*, 281–297.

Blockchain-Based Zakat Collection to Overcome the Trust Issues of Zakat Payers. (n.d.).

Dahdal, A., Truby, J., & Ismailov, O. (2022). The Role and Potential of Blockchain Technology in Islamic Finance. *European Business Law Review*, *33*(2).

https://kluwerlawonline.com/api/Product/CitationPDFURL?file=Journals\EULR\EULR2022005.pdf

Differences in Household Composition: Hidden Dimensions of Poverty and Displacement in Somalia|JDC. (n.d.). Retrieved October 31, 2025, from https://www.jointdatacenter.org/literature_review/differences-in-household-composition-hidden-dimensions-of-poverty-and-displacement-in-somalia/

Hamdani, L. (2020). Zakat Blockchain: A Descriptive Qualitative Approach. *EkBis: Jurnal Ekonomi Dan Bisnis*, *4*(2), 492–502. https://doi.org/10.14421/EkBis.2020.4.2.1270

Hassan, M. K., Rabbani, M. R., Khan, S., & Ali, M. A. M. (2022). An Islamic Finance Perspective of Crowdfunding and Peer-To-Peer (P2P) Lending. In M. K. Hassan, M. R. Rabbani, & M. Rashid (Eds.), *FinTech in Islamic Financial Institutions: Scope, Challenges, and Implications in Islamic Finance* (pp. 263–277). Springer International Publishing. https://doi.org/10.1007/978-3-031-14941-2_13

Hussein, M. A. A. (2017). The Role of Zakat in Poverty Alleviation in Somalia "Analytical Study on Islamic Economics." *Mogadishu University Journal*, *3*.

Ikhwandha, M. F., & Hudayati, A. (n.d.). *The Influence of Accountability, Transparency, and Affective and Cognitive Trusts on Interest in Paying Zakat*.

Islamic DeFi: The Future of Shariah-Compliant Fintech on Blockchain - FinTech Weekly. (2025, March 12). FinTech Magazine Article. https://www.fintechweekly.com/magazine/articles/islamic-decentralized-finance-defi-explained?utm_source

Islamic Finance: Using blockchain to improve transparency of zakat process. (n.d.). The Edge Malaysia. Retrieved October 31, 2025, from https://theedgemalaysia.com/article/islamic-finance-using-blockchain-improve-transparency-zakat-process?utm_source

Juniati, W., & Widiastuti, T. (2024). Intention to Adopt Blockchain Technology for Zakat Management in Indonesia. *Journal of Islamic Marketing*. https://doi.org/10.1108/JIMA-12-2023-0384

Khairi, K. F., Laili, N. H., Sabri, H., Ahmad, A., Pham, V. H., & Tran, M. D. (2023). The Development and Application of the Zakat Collection Blockchain System. *Journal of Governance and Regulation*, *12*(1, special issue), 294.

Khan, S. (2024). A Blockchain-Based Decentralized Zakat Collection and Distribution Platform. *Proceedings of the 2023 7th International Conference on Software and E-Business*, 9–13. https://doi.org/10.1145/3641067.3641071

Kidwai, A. (2021, July 27). ZakatTech & Crypto-Philanthropy: Can Blockchain Make Any Real Difference in Zakat Management? *NZF WorldWide*. https://nzfworldwide.com/zakattech-crypto-philanthropy-can-blockchain-make-any-real-difference-in-zakat-management/

Mokodenseho, S., Syafri, M., Hasrullah, H., & Judijanto, L. (2023). Utilizing Blockchain Technology to Increase Transparency in Zakat Management.

West Science Islamic Studies, *1*(01), 01–09. https://doi.org/10.58812/wsiss.v1i01.280

MPPN. (2025, January 13). *Somalia Launched Its First Multidimensional Poverty Index Report*. https://www.mppn.org/somalia-launched-its-first-multidimensional-poverty-index-report/

Opaque Operations: The Transparency Gap in Humanitarian Work in Somalia. (n.d.-a). Counter Extremism Project. Retrieved October 31, 2025, from https://www.counterextremism.com/content/opaque-operations-transparency-gap-humanitarian-work-somalia

Opaque Operations: The Transparency Gap in Humanitarian Work in Somalia. (n.d.-b). Counter Extremism Project. Retrieved October 31, 2025, from https://www.counterextremism.com/content/opaque-operations-transparency-gap-humanitarian-work-somalia

Overview. (n.d.). [Text/HTML]. World Bank. Retrieved October 31, 2025, from https://www.worldbank.org/en/country/somalia/overview

Owino, B. (2020). Harmonising Data Systems for Cash Transfer Programming in Emergencies in Somalia. *Journal of International Humanitarian Action*, *5*(1), 11. https://doi.org/10.1186/s41018-020-00077-1

Rejab, S. N. M., Wahid, H., & Yaacob, S. E. (2023). The Importance of Accountability in Zakat Institutions. *Business and Management Horizons*, *11*(2), 35. https://doi.org/10.5296/bmh.v11i2.21034

Sabri, A. S. M., Saquib, M. N., Anwar, A., Hazlan, A. S., & Zeki, A. M. (2025). The Future of Zakat in Blockchain Era: Opportunities and Implementation Challenges. *International Journal on Islamic Applications in Computer Science and Technology*, *13*(1). https://ijasat.com/index.php/ijasat_en/article/view/29

Sabzian, H., Aliahmadi, A., Azar, A., & Mirzaee, M. (2018). *Economic inequality and Islamic Charity: An exploratory agent-based modeling approach* (No. arXiv:1804.09284). arXiv. https://doi.org/10.48550/arXiv.1804.09284

Somalia Launched Its First Multidimensional Poverty Index Report. (n.d.). UNDP. Retrieved October 31, 2025, from https://www.undp.org/somalia/news/somalia-launched-its-first-multidimensional-poverty-index-report

Somalia Launches Official National Multidimensional Poverty Index: Two Thirds of People in Somalia Are Poor. (n.d.). Retrieved October 31, 2025, from https://ophi.org.uk/news/somalia-launches-official-national-multidimensional-poverty-index-two-thirds-people-somalia?utm_source

Somalia Poverty Report 2023. (n.d.).

The Challenge of Informality. (n.d.). Retrieved October 31, 2025, from https://media.odi.org/documents/12258.pdf

Zulfikri, Z., Hj Kassim, S., & Hawariyuni, W. (2021). Proposing Blockchain Technology Based Zakat Management Model to Enhance Muzakki's Trust in Zakat Agencies: A Conceptual Study. *Journal of Accounting Research,*

Organization and Economics, *4*(2), 153–163. https://doi.org/10.24815/jaroe.v4i2.20467