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صدقه و زکات برای خدمات بشردوستانه در غزه از طریق سازوکارهای جایگزین انتقال وجه

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چکیده

غزه با بحران عمیق انسانی مواجه است و غیرنظامیان این منطقه به‌دلیل کمبود دسترسی به نیازهای اولیه همچون غذا، آب، مراقبت‌های بهداشتی و سرپناه در مضیقه هستند. در پژوهش پیش‌رو، چگونگی انتقال صدقه و زکات از طریق شبکهٔ بلاک‌چین برگرفته از سامانهٔ حواله با هدف سازوکاری جایگزین برای تأمین مالی بررسی شده است. ازآنجاکه سامانهٔ حواله خارج از چارچوب نظارتی متعارف فعالیت دارد، نظارت و تنظیم مؤثر بر معاملات آن برای نهادهای ذی‌صلاح توأم با دشواری است؛ ازاین‌رو، حفظ یکپارچگی نظام حواله از طریق شفافیت مبتنی‌بر بلاک‌چین ضرورتی است انکارناپذیر. نظام حواله‌مانندی مبتنی‌بر بلاک‌چین، توزیع وجوه را به‌شکل غیرمتمرکز سامان می‌دهد، وابستگی به واسطه‌های متمرکزی را که ممکن است دچار سوگیری سیاسی باشد کاهش می‌دهد و خطر انحراف یا سوءمدیریت وجوه به‌دست اشخاص ناصالح را به حداقل می‌رساند. در این مطالعه با بهره‌گیری از رویکرد کیفی، مبتنی‌بر مرور جامع پیشینهٔ پژوهشی و بررسی مطالعه‌های موردی، به‌دنبال درک پیچیدگی‌های سازوکارهای جایگزین تأمین مالی مبتنی‌بر حواله در بسترهای بشردوستانه بوده‌ایم که امری مهم به‌شمار می‌رود. پیشنهاد می‌شود بسترهای اهدای مبتنی‌بر بلاک‌چین به برنامه‌های موجود توزیع کمک‌های مبتنی‌بر بلاک‌چین متصل شود. با رویکردهایی نوآورلنه، به‌دنبال برقراری پیوند میان نظریه و عمل و بینش‌های کاربردی برای افزایش تلاش‌های بشردوستانه در مناطق جنگی همچون غزه بوده‌ایم؛ همچنین، بر این استدلال استواریم که به‌کارگیری نظام الهام‌گرفته از حوالله مبتنی‌بر بلاک‌چین، به‌منظور تشویق عموم به اهدا و حمایت از توزیع کمک‌ها برای قربانیان جنگ در غزه کارا خواهد بود.

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Sadaqah and zakat for humanitarian services in Gaza via alternative fund transfer mechanisms

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Abstract

Gaza is facing a severe humanitarian crisis, with civilians suffering from a lack of access to basic necessities such as food, water, healthcare, and shelter. This research investigates how sadaqah and zakat can be transferred through hawala inspired blockchain network as an alternative Fundraising Mechanism. The fact that hawala operates outside the conventional regulatory framework makes it challenging for authorities to monitor and regulate hawala transactions effectively. Thus, it is necessary to safeguard the integrity of hawala system with blockchain transparency. A blockchain-based hawala like system decentralizes the distribution of funds, reducing the reliance on centralized intermediaries who may be politically-biased and minimizes the risk of funds being diverted or mismanaged by unscrupulous parties. The study adopts a qualitative approach thorough review of literature and use case studies, essential for understanding the complexities of hawala alternative fundraising mechanisms in humanitarian contexts. The research recommends connecting blockchain donation platforms to an existing blockchain based aid distribution program. By proposing innovative approaches, this paper bridges theory and practice, offering actionable insights for improving humanitarian efforts in conflict zones like Gaza and puts forth the case for the use of a blockchain-based hawala inspired system to encourage the public to donate and support aid distribution to the war victims of Gaza.

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1. Introduction to humanitarian crisis in Gaza

The topic of Gaza has been in the news for decades. However, the recent coverage of Gaza reached unprecedented levels (Relief Web, 2023). An independent study, using the Gaza Mortality Survey (GMS) published in the leading journal in global health, the Lancet Global Health, estimated about 75,200 violent deaths occurred between Oct 7, 2023 to Jan 5, 2025. Violent deaths are caused by direct attacks like air strikes. Men are the highest causality followed by children. In addition, there were an estimated 16,300 non-violent death. These refer to death due to collapse of health system and infrastructure (Spagat et al., 2026).

It is crucial to revisit history to understand the events that have led to the humanitarian crisis in Gaza today. The current situation is a consequence of the colonization of the Middle East by the British Empire especially in Palestine. One of the controversial historical document was the Balfour Declaration, issued by the British Government in 1917 that pledged to establish Palestine as the national home of the Jewish people and to use their best efforts to achieve this goal (Smith, 2010). At the end of the World War II, the British mandate in Palestine ended with the United Nations' resolution to partition the state into Jewish and Arab states (United Nations General Assembly, 1947), instead of declaring self-determination of Palestine (United Nations, 1966).

From the Balfour Declaration to the end of the British mandate in Palestine, the culmination of British political strategies, alongside with the pressures from the Zionist, led to the establishment of the state of Israel on May 14, 1948 (Smith, 2010). This date is commemorated by Palestinians as Nakbah Day, marking a catastrophic event in their history. The Nakbah resulted in the expulsion of at least 750,000 Palestinians from their homes and lands by military forces, leading to Israel's control of 78% of Palestine. The remaining 22% was divided into what are now the occupied West Bank and the occupied Gaza Strip (*Al-Jazeera*, 2022). For Palestinians, Nakbah Day symbolizes the systematic cleansing of their ethnicity from the land.

Another significant date to note is June 1967, when the occupation of the West Bank, including East Jerusalem, and the Gaza Strip placed the entirety of Palestine under the direct control and administration of Israel (UNESCWA, 2022). Further, the economic and political sanctions were instituted against the Gaza Strip beginning in February 2006 subsequent to the electoral success of Hamas during the elections (Asatiani, 2024) accompanied by the withholding of financial resources by international contributors. The blockade of the Gaza Strip was imposed by Israel following the assumption of control by Hamas in June 2007. In September 2007, Israel designated the Gaza Strip as hostile territory and implemented restrictions on the movement of goods in and out of Gaza, citing security concerns and as a means to exert pressure on the nascent government as part of its anti-terrorism endeavours (United Nations General Assembly, 2010).

Another important event that led to the current situation was Hamas' surprised infiltration into Israel on October 7, 2023, prompting Israeli Prime Minister Benjamin Netanyahu to declare war to Palestine and responded by deploying a large military battalion to Gaza (*CNN*, 2023). On top of the battalion, Human Rights Watch (HRW) documented that the Israeli soldiers used white phosphorous that violates the international humanitarian law in its military operations in Gaza, a place of one of the most dense population in the world (Human Rights Watch, 2023a). Meanwhile, the Integrated Food Security Phase Classification reported that due to Israel's forced evacuations of people in Gaza, the 1.9 million displaced individuals, currently concentrated into an increasingly smaller geographic area, face an increased risk of famine (Integrated Food Security Phase Classification, 2023). The HRW further reported evidence that the Israeli government used starvation as a weapon of war against civilians in Gaza, deliberately denying them access to food and water (Human Rights Watch, 2023b). The situation worsened when the Israeli government alleged that workers of the United Nations Relief and Works Agency for Palestine Refugees (UNRWA) had links with Hamas (*The Times of Israel*, 2024), leading to the destruction of UNRWA shelters for Palestinians. Several states subsequently announced the suspension of funding to UNRWA, including many Western countries: Austria, Estonia, Finland, Germany, Italy, Latvia, Lithuania, the Netherlands, Romania, Sweden, the USA, Iceland, the UK, Canada, and Australia (*Amnesty International*, 2024).

Due to the ongoing atrocities in Palestine for nearly eight decades and the escalation of Israeli aggression in 2023, Gaza is facing a severe humanitarian crisis. Civilians endure a lack of access to basic necessities such as food, water, healthcare, and shelter. The destruction of infrastructure, including hospitals, schools, and homes, compounds the suffering of the population, especially impacting women, children, and the elderly. The response of the international community to the plight of Gaza's victims has sparked debate and criticism, with questions raised about the political will of Western countries and the broader international community to provide essential humanitarian aid.

The aim of this paper is to explore the concept of delivering sadaqah (charity) and zakat (alms tax) through blockchain as a means to provide welfare to the people of Gaza despite the blockade they are facing. To achieve this goal, the paper is organized into four sections. Following this introduction, the second section will delve into the methodology while the third section will be the discussion on the concept of hawala as an alternative transfer mechanism to deliver funds for the war victims in Gaza. Subsequently, the paper will explore the negative connotations associated with hawala, which could impact its effectiveness as a transfer mechanism of sadaqah and zakat for Gaza's war victims. Following this, the paper will analyze how the use of blockchain technology can address the limitations of hawala. Finally, it concludes

with the idea of implementing a blockchain-based hawala inspired system to encourage public donations of sadaqah and zakat for the war victims in Gaza.

2. Methodology

This study explores fund transfer through the traditional hawala system and the issues surrounding hawala, it then examines how blockchain use cases can overcome the negative issues related to hawala to ensure effective funds transfer to areas like Gaza. This research involved a qualitative methodology where relevant literature and use cases were reviewed and critically analysed through non-doctrinal content analysis. A qualitative methodology was employed as the subject matter of this research is exploratory and at a conceptual stage. The literature has been reviewed and synthesized with analysis of use cases, the discussion and findings are presented below.

3. Discussion

3.1. Hawala as an alternative fundraising mechanism for Gaza

Hawala, is an Arabic term meaning 'transfer', that serves as a traditional informal method for efficient funds transfer used by millions of expatriates worldwide to send remittances to their families. Despite its informal nature, hawala plays a significant role in facilitating economic transactions and providing humanitarian aid. The First International Conference on Hawala, held in Abu Dhabi in 2002, aimed to explore hawala beyond media sensationalism and rushed policy responses, acknowledging its economic and humanitarian significance (Passas, 2005).

It is essential to recognize that hawala, as an informal funds transfer method, caters to a diverse clientele, encompassing both upright individuals and individuals engaged in illicit activities. While acknowledging the need for financial controls to counter money laundering and terrorism financing, it is important to understand that such measures alone are not a complete solution. Despite its importance, there has been a tendency to overemphasize hawala's susceptibility to abuse, potentially overshadowing its legitimate role in facilitating economic transactions and humanitarian aid. For instance, hawala is labelled as "Hamas's Private Banking" (Vaknin, 2023) or "tunnel funds" (Yarom, 2015).

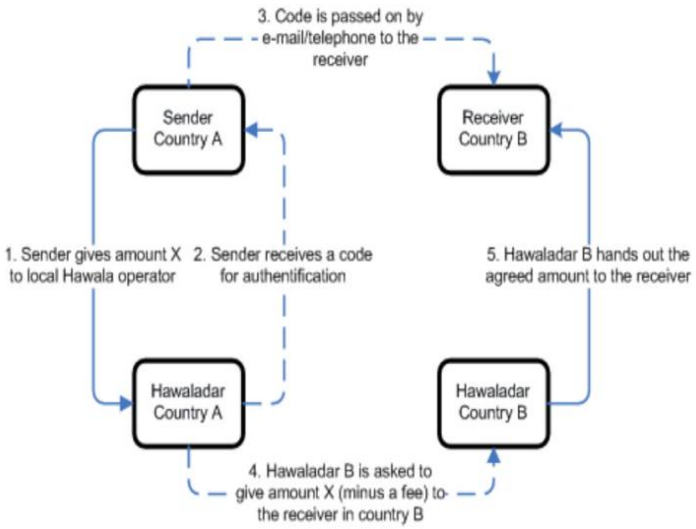
The hawala business can be delineated into two primary components: (i) the transmission and reception of funds, which entail the interactions between a hawaladar and their clients; and (ii) the settlement procedure, which involves the relationships among intermediaries (Passas, 2005). Hawaladars are the hawala brokers. Using Pakistan as an illustration, the comparison made by Passas (2005) showcases the superior financial benefits of hawala over other methods. When approximately US$100 is sent from Dubai, hawala outperforms

its competitors by a significant margin. Recipients receive a higher amount in cash compared to alternative options, without incurring additional charges or fees. This translates to better rates and lower overall costs, making hawala the most financially advantageous choice.

Additionally, hawala offers convenient home delivery or pickup, facilitates communication with individuals of the same language and region, bypasses bureaucratic procedures and paperwork, ensures confidentiality, and enables swift delivery even to remote areas. The foundation of trust and mutual interests between hawaladars and their clients further bolsters the efficiency of global hawala networks. Despite efforts by formal institutions to capture a larger market share, entrenched cultural habits pose obstacles to their success in the multibillion-dollar global remittance market. Similar to the formal banking system, the hawala system operates without the necessity of physically transferring cash to complete a transaction (Dean, 2015). However, what sets it apart is the absence of any form of promissory note. Unlike traditional banking, there are no written contracts to ensure payment; instead, transactions rely on trust bonds and the agents' motivation to uphold their reputation within the network.

According to El Qorchi et al. (2003), in its simplest form, hawala remittance operates as follows: when a migrant worker in Country A intends to send money to a relative in Country B, they approach a local hawala operator and provide the desired transfer amount. In return, the sender receives a code, which they convey to their relative via email or telephone. The hawala operator in Country A then contacts a counterpart in Country B, requesting them to disburse the agreed amount to the beneficiary. The recipient in Country B can then collect the funds (with a small transaction fee deducted by the operators) from the hawala operator in their country by presenting the code. Consequently, the hawala operator in Country A becomes indebted to the one in Country B, as the former collected the money while the latter disbursed it. These operators manage their own cash reserves for transactions and maintain records of their reciprocal indebtedness. To balance their accounts, the operator in Country B may receive compensation through a hawala transfer going in the opposite direction, although the majority of transactions flow from developed to developing countries. Various methods, such as under/over-invoicing goods or conventional bank transfers, are used to settle accounts between hawala operators. This hawala remittance system is illustrated in Figure 1.

However, there is a lack of monitoring from a central regulatory body, as such hawala is seen as a conduit for illicit activities, and often illegal in many jurisdictions.



Source: Wang (2010)

Figure 1. Hawala remittance system

There have been nevertheless, guidelines issued to regulate hawala. For instance, in Somalia, guidelines on how to use hawala in Somalia has been created by African Development Solution (Adeso) on behalf of the Somalia Cash Based Response Working Group (CBRWG) covering the selection and partnership with money transfer companies offering hawala, for distributing cash in Somalia providing insights into the nature of hawala, their operational mechanisms, and offer concise instructions for humanitarian agencies seeking to collaborate with them for cash transfer initiatives in the region (Adeso & Swiss Agency for Development and Cooperation SDC, n.d.). In annex 1 of these guidelines, even a contract template is provided that could be used in this regard.

In Syria which is a war zone, for instance, registered hawalas are effectively utilized for Cash Transfer Programming (CTP) in areas under government control (Dean, 2015). However, due to regulatory constraints, confidentiality requirements must be meticulously observed. Conversely, in the vast regions of Syria beyond government jurisdiction, where significant humanitarian needs persist, unregistered hawalas are employed to address operational costs for NGOs and to compensate their suppliers. These unregistered hawalas serve as the sole, albeit partially scalable, cash-out facility available in such areas (ibid).

By fostering genuine dialogue and incorporating empirical evidence into policymaking processes, regulators can develop more effective and balanced regulatory frameworks that acknowledge hawala's dual role while mitigating risks associated with illicit activities, this research

therefore examines if a hawala inspired solution using blockchain may provide an efficient and legally acceptable solution.

However, before the blockchain solution is explored, this paper moves on to explain why hawala is illegal in some jurisdictions.

3.2. Negative connotations associated with the hawala system

Notwithstanding the benefits of hawala, the fact that it operates as part of the shadow financial domain has resulted in negative connotations being associated with the hawala system. This section assesses the negative connotations associated with the hawala system due to its lack of transparency.

The hawala system is an ancient system based on trust (Redin et al., 2014), it is generally unsupervised by a formal regulatory body which makes it an informal system separate from the financial system. Hawala also known as hundi has been described as 'unofficial' and 'lacking in legal accountability' (Martin, 2009). Remittances involving money transfers are not monitored; in other words, there is no central body that monitors the amount which is transferred or where the funds are transferred to. There are no detailed accounts or paper trail of where and how much is transferred between countries. While there maybe records made by the operators of the hawala, these records are usually brief and without details usually present in remittances through regulated institutions. There is lack of due diligence or any formal records of the customers. This allows money transfers to be anonymous (Arora, 2023).

The fact that hawala operates outside the conventional regulatory framework makes it challenging for authorities to monitor and regulate, hawala transactions effectively. This lack of oversight can create opportunities for abuse and illegal activities (Habjouqa & Clendinning, n.d.). Illegal activities include money laundering, terrorist financing (*The Star*, 2024), evasion of tax, and currency controls, smuggling illegal items and payments for illegal trade (Passas, 2003).

Hawala also affects the financial system of a country. The IMF in a joint study with the World Bank on informal funds transfer system, highlighted that these systems affected the reliability of statistical information and economic data needed by policy makers to make informed decisions, it also affected indirectly monetary policy as it affects the components of broad money. The IMF also believed that these informal funds transfer systems possibly affect exchange rates of foreign currency due to its effect on supply and demand, and have negative fiscal consequences on remitting and receiving countries. The IMF finally stated that the full consequences of these informal funds transfer system cannot be explored because there is no data available to trace the transactions (El Qorchi et al., 2003).

Hawala is illegal (Dikio, 2024) in certain jurisdictions like India and Malaysia (*The Economic Times*, 2010) but are licenced and regulated

in others like UAE and even in the United States (Habjouqa & Clendinning, n.d.). There are also hawala operators who operate in jurisdictions that license hawala operators but due to costs do not register for a license for their operations (Freeman & Ruehsen, 2013). Hawala system may be informal but it has also been described as 'sophisticated' and 'deep' and their origins are difficult to track (Feiler, 2007). It is due to these reasons hawala operations are treated with suspicion and are considered illegal in a number of jurisdictions.

The IMF in their study on informal funds transfer system recommended that countries having informal hawala system should require the hawala dealers to be registered and keep sufficient records according to the Financial Action Task Force (FATF) standards. The IMF also recommended that these countries should at the same time examine their formal funds transfer financial systems to review where the flaws are and address them thus minimising the need for the hawala system. The IMF also emphasised that having regulations itself was not enough, and there should be appropriate supervision and enforcement of the regulations (El Qorchi et al., 2003).

Nonetheless, the IMF acknowledged that the practical reasons for having a hawala system from the customers' point of view cannot be denied, especially when there are flaws or there is a failure in the formal financial funds transfer system (ibid).

3.3. A conceptual appraisal of blockchain transparency for the negative connotations associated with the hawala system

If hawala is to play an effective role as an alternative fund distribution mechanism to alleviate the humanitarian crisis in Gaza, it is imperative that a solution be found to address the negative connotations associated with the system. Integrating blockchain technology with hawala transactions presents a promising solution to the challenges of transparency and regulatory compliance to enhance the effectiveness of hawala as an alternative fundraising mechanism to support the welfare of war victims in Gaza. Hawala, with its historical use for charitable purposes worldwide, faces obstacles in ensuring that funds reach their intended recipients transparently and without the risk of misappropriation, particularly in conflict zones like Gaza.

Blockchain's transparent and immutable ledger offers a revolutionary approach. Every hawala transfer would be securely recorded as a block on the blockchain, visible to all network participants (Crosby et al., 2016). This transparency addresses the critical issue of misappropriation risk. Donors can now verify, in real-time, that their contributions indeed reach the intended beneficiaries, thus fostering greater trust and confidence in the fundraising process (Tapscott & Tapscott, 2016). This in turn would improve contribution rates.

Moreover, the integration of smart contracts into the blockchain system can automate compliance with stringent international

regulations. These self-executing agreements can enforce Know Your Customer (KYC) and Anti-Money Laundering (AML) requirements, reducing the administrative burden on hawala operators and aiding organizations (Swan, 2015). This not only ensures adherence to regulatory standards but also mitigates legal risks associated with cross-border fund transfers.

The real-time auditability of blockchain transactions is another significant advantage. Aid organizations and regulatory bodies can monitor the flow of funds as they occur (Casey & Vigna, 2018), allowing for prompt identification of any irregularities or suspicious activities. This capability empowers stakeholders to intervene swiftly, preventing potential misuse of funds and ensuring that resources are allocated efficiently to where they are most needed.

The enhanced transparency and accountability brought by blockchain integration not only improve trust among participants but also streamline the entire aid distribution process. Aid organizations working in Gaza rely on efficient and transparent mechanisms to deliver assistance promptly. By utilizing blockchain technology, the delivery of aid can become more effective and timely, ensuring that crucial support reaches war victims in a timely manner.

3.4. Use cases using blockchain technology for money transfer for aid

In this section, we will discuss some use cases that have incorporated blockchain as part of the money transfer system. We divide these use cases into two categories (i) fund raising, and (ii) aid distribution.

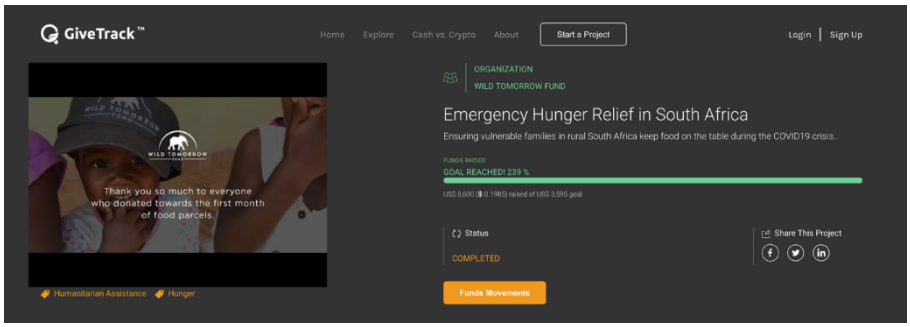
Let us start with the fundraising use case. There are a number of use cases where you either donate on a blockchain platform, or donate your cryptocurrency.

For example, BitGive is a Bitcoin and Blockchain technology 501(c)(3) non-profit entity in the US. In 2015 it established Give Track which allowed non-profit organizations (NPOs) to crowd fund on its platform. The NPOs collect donations in cryptocurrency and share its financial information and project performance on the platform as well. Figure 2 shows the fund raising part; very similar to other crowdfunding platform, except the donation is made with cryptocurrency. Figure 3 shows the project report updated by the NPO. Donors can click on the "proof" icon, where they can view the invoice and/or proof of the transactions. Although the proof is still a scan copy of the paper invoice, this is a good starting point for transparency. It also allows the donor to view the transaction details in the blockchain.

This approach enhances accountability and trust in relief efforts, empowering donors to contribute with confidence knowing that their contributions were making a direct impact on the ground (Salisu, 2023).

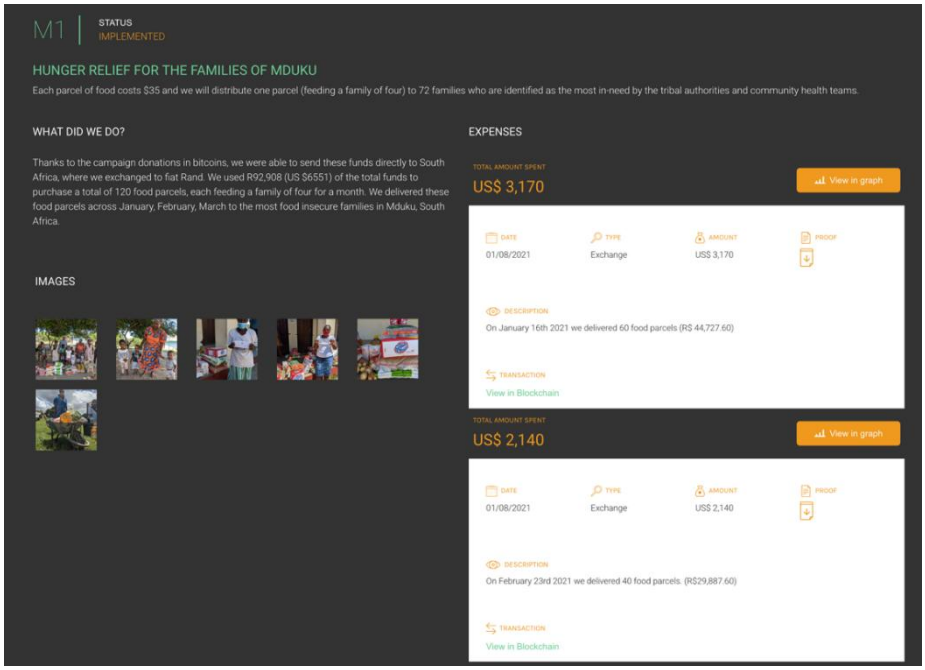
On a regional level, Malaysia has witnessed a few experiments with the use of cryptocurrency to alleviate the humanitarian crisis in Gaza, however these use cases do not use blockchain to actually transfer the

donated funds to Gaza, instead they allow cryptocurrency to be donated for the Gaza cause. In each of the following cases the cryptocurrency is converted to fiat money and then distributed by known charitable organisations working for the Palestinian cause.



Source: GiveTrack (2021)

Figure 2. Fundraising on GiveTrack



Source: GiveTrack (2021)

Figure 3. Project report on GiveTrack

The first use case is the Save Palestine (PAL) cryptocurrency coin which allows buyers to invest and contribute by buying the token. The co-founder, Radzi Tajuddin of this investment cum donation venture, stated that the proceeds received by the sale of the token, is distributed in the following way: the venture reserves 30% for donations to

Palestinians, 40% is for the investors and the remaining 30% is for controlling the supply (*Malaysia Now*, 2024). The investors themselves can exchange the PAL token for a Binance Coin (BNB) on Pancake Swap (digital asset exchanger) and then convert the BNB to other fiat currencies like the US Dollar (USD) or Malaysian Ringgit (MYR) if they want to cash-out. Donations are distributed weekly based on the token's market capitalization. The tokens for donations are sent to Global Sadaqah who converts them to fiat currency and then distributes it accordingly through Global Sadaqah's channels.

Another pro-Palestine project in Malaysia was spearheaded by MyCARE which is a non-profit organization that advocates humanitarian efforts in Southeast Asia and war-torn countries in the Middle East (MyCARE, 2024). MyCARE's cryptocurrency project was launched in partnership with SharLife. Here donors transfer supported cryptocurrencies such as Bitcoin (BTC), Ethereum (ETH) and Solana (SOL) to a secure crypto wallet where the cryptocurrencies will be converted into USDT (Tether) which is a stablecoin designed to preserve value (SharLife, 2024). The USDT would then be exchanged for USD before being transferred to MyCARE that support the Palestinian cause.

While the above examples have shown how fundraising may be done via tokens, as blockchain was not used for the actual transfer there is no end to end tracking of the use of funds, and opens room for fraud/ AML and/or misuse of resources. The Aman Palestine Berhad (APB) case supports this point. APB is a company limited by guarantee registered under the Companies Commission Malaysia as an NGO collecting donation for Palestine. On 15 February 2024, the Malaysian Anti-Corruption Commission (MACC) charged the Chairman and the CEO of APB with 126 charges of cheating, criminal breach of trust, and money laundering totalling more than RM39 million (≈USD9.75m). As of the time of writing, the court cases are ongoing pursuant to the Malaysian Penal Code and the Anti-Money Laundering, Anti-Terrorism Financing, and Proceeds of Unlawful Activities Act 2001 (Khairulrijal, 2024).

Next, let us examine block chain supported aid distribution that could potentially manage the issue of mis-use of funds.

The UNHCR's pilot project using blockchain technology to disburse cash to individuals affected by the war in Ukraine is a case study leveraging innovative solutions for humanitarian aid (UNHCR, 2023). By collaborating with the United Nations International Computing Centre (UNICC), the Stellar Development Foundation (SDF), and receiving pro bono legal advice from Linklaters, UNHCR successfully executed a pilot to distribute cash assistance using Circle Internet Financial's USD Coin (USDC), a stablecoin pegged to the US Dollar. This initiative allowed recipients to access funds directly through digital wallets on their smartphones. The project potentially opens

doors for broader adoption of digital solutions for aid distribution in Gaza.

Next, case study is the World Food Programme's (WFP) Building Blocks Project which showcases a much more comprehensive blockchain based aid distribution network. In the current humanitarian aid ecosystem, aid is ad hoc with no central registry. So, there is no good understanding of who is assisting whom with what. This results in over or underserving the beneficiaries. Traditionally aid was distributed in kind, but post 2010, cash based transfer became more common. At the same time, many humanitarian aid bodies compete for the same donor. Since there is high competition to show that an organization has the best system, this led to system's war and diminished the motivation to collaborate among different players (Haddad, 2024).

In 2017, faced with growing needs in refugee camps and a mandate to do more with limited funds, the United Nations World Food Programme (WFP) turned to blockchain to improve aid distribution. Figure 4 summarizes the evolution of Building Blocks (BB) project. From a small proof of concept in Pakistan with 100 people the project reached scale in 2021 serving one million people. As of 2025, BB has supported 6 million people through emergency responses in Jordan, Bangladesh, Ukraine, Lebanon, Syria and Palestine. More than US$760 million in assistance has been transferred equating to more than 40 million individual beneficiary redemption transactions. BB runs on a private Ethereum-based blockchain enabling millions of transactions per month with zero on-chain fees. By eliminating intermediaries, BB saved over $3.5m in transaction fee for WFP by 2023 (United Nation, 2026).



Source: United Nation (2026)

Figure 4. Evolution of WFP building block

Next an explanation on how BB works. The WFP team understood that tackling the aid distribution was not only a database problem. There was also a key political issue regarding who owns the system. Therefore, BB is a collection of blockchain validator nodes which are

operated independently by each participating organization. Any UN organizations or international NGOs with a proven track record of do no harm may join the network for free. Together, they connect to form a humanitarian blockchain network that provides a neutral space to collaborate, transact and securely share information in real-time. This network is co-owned, co-operated and co-governed, avoiding any political issues relating control.

WFP then created a blockchain wallet using smart contract which any member is free to use. Each organization can deposit their token into the wallet. Everyone has visibility of all the tokens, but can control and spend only their token. This creates visibility on what aid is available and who has used it. It also serves the beneficiary much better as they only need to redeem assistance in a single place instead of performing multiple transactions at multiple desks (Haddad, 2024).

The key benefit of this visibility is reducing unintended duplicated assistance; i.e. overlapping assistance. Since 2022, BB has prevented more than USD 270 million in overlapping assistance in Ukraine alone and USD 287 million across Ukraine, Syria and Palestine (WFP, n.d.)

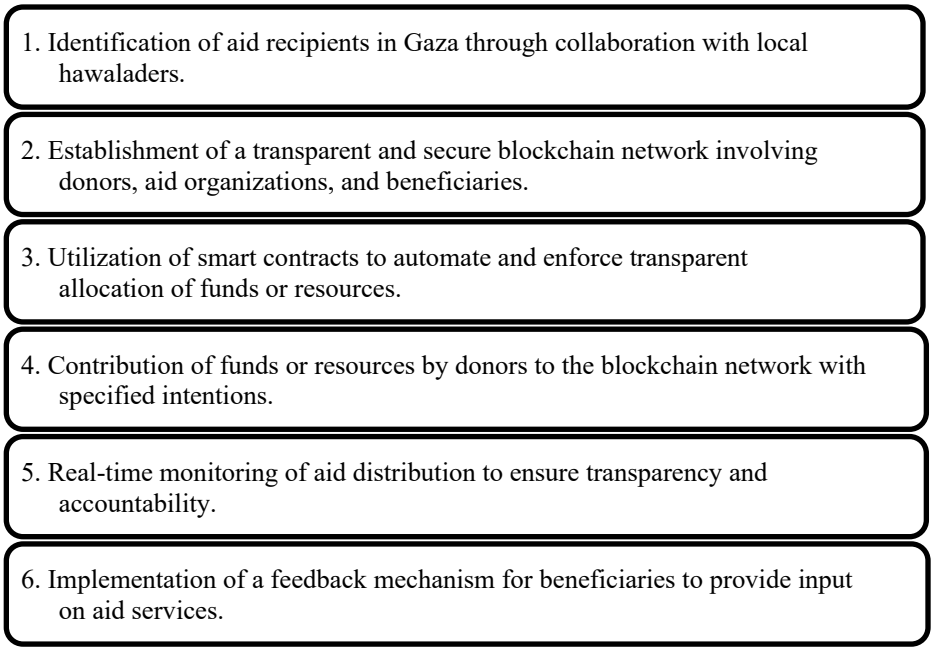
Unlike public cryptocurrencies, this blockchain is private to only trusted members, similar to a hawala. Unlike hawala, each transaction is recorded and verified on the shared ledger. It also creates an immutable audit trail where every transaction is logged and cannot be altered. United Nation (2026) provided a simple explanation to illustrate how BB works: "If an organization loads US$50 of food assistance to a refugee's account and the refugee spends US$10 at a local shop, both events are recorded on Building Blocks. Any network member serving that refugee can instantly see the updated balance and know exactly what assistance has been delivered and redeemed. This real-time transparency helps prevent both errors and fraud while enabling rapid troubleshooting – if there's an issue with a transaction, staff on the ground can detect and resolve it on the spot."

At the time of this writing UN Women, UNICEF and UNFPA (sexual & reproductive health agency) are members of BB. In addition, cash working groups and cluster partners in different countries also uses BB to prevent overlapping assistance. WFP provides BB to these local groups on a free "Software As A Service" basis. This inclusive approach means smaller NGOs can join large operations on a plug and play basis instead of building their own system. With these efforts the use of BB has expanded across 159 organizations. (United Nation, 2026), (WFP, n.d.).

4. Conclusion

In a nutshell, by leveraging blockchain technology, humanitarian organizations can streamline aid distribution processes, reduce inefficiencies, and ensure that aid reaches its intended recipients in a transparent and accountable manner. This approach empowers donors

with confidence in the impact of their contributions and facilitates more effective humanitarian assistance to communities in need, including those in Gaza. The key steps in the use of blockchain for the delivery of aid to Gaza are set out in Figure 5.



Source: Authors

Figure 5. Key steps in utilizing blockchain technology for sending aid to Gaza

As we have discussed in the previous section, many of these steps currently exist, but not yet connected. For example, Building Blocks by WFP have already covered steps 1,2,3,5 and potentially six. Only donors are not directly connected to Building Blocks. On the other hand, platforms like GiveTrack, MyCARE/Sharlife and PAL Coin connects donors to projects, however, donors do not have the direct access to BB for real time monitoring.

What needs to be done is connecting the fund raising side to the aid distribution side. Established NGO's especially may be onboarded unto Building Blocks's Blockchain. If not as full member, the connection may be done on the 'Software As A Service' basis that WP already have in place. An Application Programming Interface (API) could be develop to connect the aid distribution data to evidence real time impact reporting to donors.

Even in the midst of conflict and limited internet connectivity, the proposed blockchain-based aid distribution system for Gaza could remain feasible for several reasons. First, blockchain technology supports offline transactions, enabling aid distribution to continue even

during periods of internet disruption. This feature allows for transactions to be conducted offline and later synchronized with the main blockchain network once connectivity is restored. Additionally, local network infrastructure, such as intranets or mesh networks, may still function within specific regions or communities, providing a means for aid organizations to facilitate blockchain transactions and maintain communication between stakeholders. Moreover, while broader internet access may be restricted, mobile connectivity often remains more resilient, especially in conflict zones where mobile networks may continue to operate during internet shutdowns. Mobile applications developed for the blockchain-based aid distribution system could utilize alternative communication channels such as SMS to facilitate transactions and provide updates to beneficiaries.

The utilization of blockchain technology for sending aid to Gaza reflects a modernization of the traditional hawala system. Historically, hawala has been a prevalent method for transferring funds across borders, relying heavily on trust and local networks. Hawala, in a sense, was the original blockchain. Transactions occur between trusted network members, albeit offline. However, this system often lacked transparency and accountability, leading to concerns about misuse or fraud. By transitioning to blockchain technology, the aid distribution process becomes more transparent, secure, and efficient. Blockchain's decentralized ledger ensures that transactions are recorded in a tamper-proof manner, providing transparency to all involved parties. Smart contracts further automate and enforce the allocation of funds or resources, reducing the potential for human error or manipulation. Moreover, real-time monitoring and feedback mechanisms enhance accountability and allow for continuous improvement of aid services, addressing some of the shortcomings of the traditional hawala system. Overall, the modernization of aid distribution through blockchain technology represents a significant step forward in ensuring that humanitarian assistance reaches those in need effectively and ethically.

In conclusion, modernizing the traditional hawala system used for aid delivery in Gaza and other war zones through blockchain technology offers numerous benefits, including enhanced transparency, efficiency, and accountability in humanitarian assistance. By addressing the policy implications outlined above, policymakers can create an enabling environment for the successful adoption of blockchain-based aid distribution models, ultimately improving the delivery of aid to those in need.

Future research in this area could focus on evaluating the long-term impact of blockchain-based aid distribution systems on humanitarian outcomes in conflict-affected regions like Gaza. Additionally, exploring innovative applications of blockchain technology, such as smart contracts and decentralized finance, could further enhance the effectiveness and scalability of aid delivery mechanisms. The

originality of such research lies in its interdisciplinary approach, combining insights from blockchain technology, humanitarian studies, and policy analysis to inform evidence-based decision-making and advance the field of humanitarian innovation.

Conflict of interest

The authors declared no conflicts of interest.

Ethical considerations

The authors have completely considered ethical issues, including informed consent, plagiarism, data fabrication, misconduct, and/or falsification, double publication and/or redundancy, submission, etc. This article was not authored by artificial intelligence.

Data availability

The dataset generated and analyzed during the current study is available from the corresponding author on reasonable request.

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