

The possibility of managing zakat funds using blockchain technology in Algeria- A Comparative Study with Malaysia

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Abstract:

This research focuses on improving fairness and transparency in Zakat management in Algeria by leveraging blockchain technology. The study aims to foster economic and social development through effective utilization of Zakat funds. Blockchain is proposed as an innovative solution to build trust between contributors and distributors, ensuring secure financial transactions and introducing revolutionary changes through the use of smart contracts. The implementation of blockchain is expected to bring dynamism and effectiveness to the Algerian Zakat system, exploring new resources and enhancing the overall economic and social system.

Keywords: Zakat; Blockchain; Zakat management; Zakat funds in Algeria; Smart contract

Jel Classification Codes : C80 ; G19 ; G29

Introduction

In Algeria, Zakat serves as a vital financial obligation, providing an alternative solution to economic challenges by boosting national income and individual incomes while fostering economic equilibrium. The study focuses on addressing challenges in Algeria's Zakat programs and proposes leveraging blockchain technology to enhance transparency, prevent fraud, and maximize Zakat's impact (Belnachet & Nadji, 2022). The specific problem addressed by the study is: **What is the contribution of Blockchain value chains in managing Zakat funds in Algeria?**

From here, the study hypotheses can be formulated as follows:

- Zakat is a significant source of national income in Algeria, with the potential to boost economic growth.

- Rational management and organization of Zakat funds yield substantial results in materializing financial projects.

- The role of Blockchain technology is deemed crucial in enhancing the management of Zakat funds in Algeria.

➤ Study Objectives and Importance

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This study primarily aims to achieve the following objectives:

- Diagnose deficiencies in Zakat funds, improving methods for trust between giver and recipient.
- Emphasize Zakat's role as an economic resource, relieving pressure on Algeria's state budget and identify mechanisms to activate Zakat funds and assess their effectiveness in boosting economic growth.

➤ **Study Methodology**

The study takes a descriptive-analytical approach, highlighting the theoretical framework of Zakat funds and emphasizing the significance of Blockchain technology in their management. The analytical phase involves a thorough examination of numerical data and statistics, enabling comprehensive analysis and interpretation for meaningful conclusions.

➤ **Study Structure**

The study is organized into four axes: the first investigates the current state of Zakat funds in Algeria, the second focuses on proposed mechanisms for their activation, the third explores the role of value chains in managing Zakat funds, and the fourth conducts an analytical comparison with the Malaysian experience. This comprehensive approach aims to provide insights, propose improvements, and enhance transparency in the management of Zakat funds in Algeria.

First Axis: Reality of the Zakat Fund in Algeria

1. Definition and Establishment of Zakat Funds in Algeria

In Algeria, the Zakat Fund, influenced by leading Islamic countries, operates as a religious and social institution under the Ministry of Religious Affairs and Endowments (Belnachet & Nadji, 2022). It aims to reinforce Zakat obligations among Muslims and provide legal coverage (Sarams & Laarifi). Givers have the option to contribute their Zakat funds to help the needy, with the flexibility to invest a portion for recipients' benefit. The Zakat Fund follows a structured approach with district, provincial, and national committees responsible for identifying eligible individuals and overseeing the organizational structure. (Ministry of Religious Affairs and Endowments, 2018).

2. The Role and Objectives of the Zakat Fund in Algeria

In Algeria, the Zakat Fund, established in 2003, is a pivotal instrument for economic development and social justice (Mousa, 2017). Economically, it ensures continuous income redistribution, supports local projects, and promotes investment. The Zakat Fund's unique local approach prevents fund transfer until regional self-sufficiency is achieved, facilitating controlled income redistribution. It also contributes to public infrastructure development and combats economic stagnation (Mousa, 2017). On the social front, the fund mitigates class conflicts, reduces disparities, and fosters social solidarity (Bensalem, 2017). The noble objectives, as outlined by Dr. Mohamed Boujellal, aim to combat poverty, narrow the wealth gap, and revive the obligation of Zakat, ensuring fair distribution among the deserving. (Sarams & Laarifi).

3. How Zakat is Distributed in Algeria

The statistics presented in the ministerial directive (Publication No. 139/2004 for the 1425/2004 Zakat season) offer a detailed breakdown of Zakat fund disbursement based on revenue thresholds. For instance, when the revenue is below 500,000,000 Algerian dinars, specific percentages are allocated to various categories, such as 87.5% for the poor and needy, 12.5% for Zakat Fund administrative expenses, and

additional percentages for various committees. If the revenue exceeds 500,000,000 Algerian dinars, the allocation shifts, emphasizing percentages for the poor and needy, Zakat Fund expenses, and fund revenue development. These statistics provide a comprehensive view of the fund distribution mechanisms. (Ministry of Religious Affairs and Endowments, 2018)

Second Axis: Mechanisms to Activate the Zakat Fund in Algeria

Algeria actively explores new financial alternatives for developmental programs, particularly emphasizing Zakat funds as a notable avenue due to their increasing collection, prompting a need for an examination of relevant statistics.

Presentation and Study of the Zakat Collection

Through the table below, we will examine the evolution of Zakat collections according to the Ministry of Religious Affairs

Table 01: Evolution of Zakat Collection from 2003 to 2017

Years	Zakat Al-Fitr	Zakat Al-Mal	Zakat Al-Zarou and Fruits	Total
2003	25.728.172,50	30,394,399.45	0	56,122,571.95
2004	114.916.162,00	108,370,579.98	16,567,254.00	239,853,995.98
2005	172.171.989,66	335,761,165.55	723,396.54	508,656,551.75
2006	215.220.889,36	439,099,934.34	32,119,363.76	686,440,187.46
2007	258.163.416,08	435,507,262.68	38,843,446.56	732,514,125.32
2008	240.960.757,50	370,048,773.87	43,115,432.98	654,124,964.35
2009	304.969.465,00	589,548,578.23	42,147,194.17	936,665,237.40
2010	322.074.119,50	536,621,104.24	40,497,584.83	899,192,808.57
2011	373.399.511,00	781,299,800.17	44,430,159.57	1,199,129,470.74
2012	444.705.479,00	801,478,212.80	60,703,409.74	1,306,887,101.54
2013	445.955.947,81	779,147,643.48	75,804,974.05	1,300,908,565.34
2014	437.563.081,20	804,303,736.90	76,747,250.58	1,318,614,068.68
2015	473.417.555,00	685,984,292.68	91,711,538.40	1,251,113,386.08
2016	515.318.879,00	678,716,480.94	73,139,529.73	1,267,174,889.67
2017	565.521.980,09	721,053,537.62	115,757,831.10	1,402,333,348.81
Total	4.910.087.404,70	8,097,335,502.93	752,308,366.01	13,759,731,273.64

Source: Bazou Aichouch, "The Role of the Zakat Fund in Stimulating Investment: A Comparative Study of Algeria and Sudan," Doctoral Thesis, Third Cycle in Economic Sciences, University of Mohammed Khider-Biskra 2018-2019, p. 168

According to the Ministry of Religious Affairs, the Zakat collection exceeded 1.456 billion Algerian dinars in 2018 (Aicouch , 2019).In 2019, the Algerian news agency, quoting the Ministry of Religious Affairs, indicated that the collection increased to more than 1.54 billion dinars. However, in 2020, due to the COVID-19 pandemic and the closure of mosques, there was a significant decline to only 730 million dinars, all directed solely to needy families.

Table 01 outlines a consistent upward trend in Zakat collection, starting at about 56 million dinars in 2003 and peaking at around 1.5 billion in 2018. A setback occurred in 2008, but confidence was restored, leading to increased national Zakat collection. The rise is credited to a Ministry of Religious Affairs awareness campaign, focusing on trust, enhanced monitoring, transparency, and regulation. Despite stability until

2019, there was a substantial decline in 2020 due to the COVID-19 pandemic and mosque closures.

2. Evolution of the Distribution of the Zakat Fund 2003-2017

The following table illustrates the distribution of the Zakat Fund's proceeds:

Table 2: Evolution of the Zakat Fund's Distribution 2003-2017

Year	Zakat Al-Mal (Al-Qout)		Zakat Al-Zarou and Fruits		Zakat Al-Fitr		Total Requests	Total Beneficiaries
	Number of Requests	Number of Beneficiaries	Number of Requests	Number of Beneficiaries	Number of Requests	Number of Beneficiaries		
2003	5.842	5.581	427	427	22.911	21.997	29.180	28.005
2004	93.106	27.465	5.064	2.835	146.406	98.558	190.576	128.858
2005	74.325	62.564	3.991	3.991	120.376	11.462	198.692	178.017
2006	98.429	80.934	15.026	8.596	146.586	138.885	260.041	228.415
2007	105.195	85.511	16.279	9.651	172.618	150.522	294.092	245.684
2008	99.278	76.586	18.348	7.348	159.653	145.946	277.279	229.580
2009	96.396	79.667	12.880	9.806	202.082	186.330	311.358	275.803
2010	106.645	84.428	12.653	6.394	180.218	165.476	299.516	256.298
2011	128.354	106.510	13.075	7.052	181.942	169.634	323.371	283.196
2012	128.883	103.419	14.106	8.228	190.940	178.855	333.929	290.502
2013	150.555	106.915	45.341	11.393	186.564	168.325	382.460	286.633
2014	116.844	94.888	37.709	16.096	172.045	161.224	326.598	272.208
2015	133.876	107.876	18.633	15.083	159.876	150.039	311.926	272.998
2016	130.058	116.015	11.666	11.086	171.925	161.406	313.649	288.507
2017	100.794	87.801	26.248	20.897	169.425	160.134	296.467	268.832

Source: Bazou Aichouch, "The Role of the Zakat Fund in Stimulating Investment: A Comparative Study of Algeria and Sudan," Doctoral Thesis, Third Cycle in Economic Sciences, University of Mohammed Khider-Biskra 2018-2019, p. 168

The table displays fluctuations in the number of families supported by the Zakat fund, peaking at 290,502 in 2011. Despite a decline in 2019 due to the COVID-19 pandemic, the need remained high. Trust issues among contributors have impacted the fund's effectiveness, leading to a partnership between the Ministry of Religious Affairs and Endowments and Algerian Baraka Bank. The collaboration aims to strengthen the fund's role through the Zakat Investment Fund, featuring an initial capital of 60,000,000 DZD and provisions for additional resources. Notable features include funding interest-free projects ("good loans") with a repayment period of 4 to 5 years (Aicouch, 2019).

3. Evolution of the amounts allocated to the "good loan."

The following table illustrates the evolution of the amounts allocated to the "good loan" from 2003 to 2014.

Table 3: The evolution of the amounts allocated to the "good loan" from 2003 to 2014

Years	Amounts
2003	4,220,348.75
2004	28,226,461.22
2005	91,376,760.79
2006	142,600,946.11

2007	137,624,679.19
2008	109,012,010.93
2009	138,363,142.74
2010	176,200,613.76
2011	270,583,602.05
2012	293,829,521.90
2013	325,410,715.58
2014	254,526,267.81
Total	1,971,975,070.83

Source: Bazou Aichouch, "The Role of the Zakat Fund in Stimulating Investment: A Comparative Study of Algeria and Sudan," Doctoral Thesis, Third Cycle in Economic Sciences, University of Mohammed Khider-Biskra 2018-2019, p. 168.

The table depicts a consistent increase in benevolent loan allocations from 2003 to 2008, with a temporary decrease in 2008 due to supporting Gaza. Subsequently, the growth rate multiplied over 12 years. The benevolent loan, suitable for micro-projects, positively impacts the economy and alleviates unemployment. However, it was suspended in 2015, citing sufficient development loans, and a need for loan retrieval. Zakat proceeds are modest compared to potential contributions, constituting only 1% of estimated payments (Belnachet & Nadji, 2022). Elevating Zakat fund management is crucial, potentially creating significant job opportunities. A program is needed for effective Zakat fund activation. (Ministry of Religious Affairs and Endowments, 2018).

4.Zakat Fund Activation Program

The Zakat fund in Algeria faces trust issues, prompting proposed measures for activation, such as transformation into an institution, enhanced contributor trust through media planning, diversification with recipient-owned institutions, encouragement of citizen contributions linked to tax reductions, and the establishment of an electronic infrastructure inspired by the Malaysian model.

Axis Three: Role of Blockchain in Managing the Zakat Fund

The Zakat management system, encompassing planning, collection, organization, and distribution, faces challenges in trust, especially from contributors. This has led to the exploration of advanced technological solutions, with blockchain technology emerging as a promising avenue for ensuring electronic security in transaction processing.

1.Nature of Blockchain

1.1 Definition of Blockchain

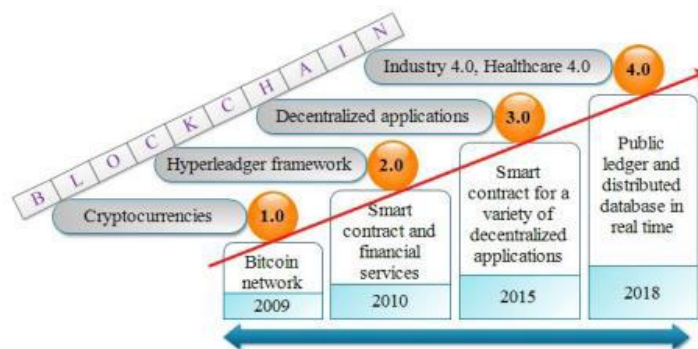
Blockchain, a digital database, allows simultaneous sharing and use of information, especially financial transactions, across a decentralized network (Marco & Lakhani, 2011). Composed of linked chains storing auditable data in blocks, it resembles a shared Google Docs spreadsheet (Hamdani, 2020). This open and distributed ledger securely records transactions through cryptography, providing a decentralized, secure, and encrypted database structure (arabic forex, 2021).The integration of software engineering, distributed computing, cryptographic science, and economic game theory facilitates rapid, accurate, and cost-effective exchange of assets and values among economic actors without intermediaries.

1.2. The Blockchain revolution

Blockchain development evolved through four generations:

- Blockchain 1.0 (2009): Marked by the creation of the Bitcoin network, introducing the first cryptocurrencies.
- Blockchain 2.0 (2010): Introduced second-layer technology, smart contracts, and applied financial services, utilizing frameworks like Ethereum and Hyperledger.
- Blockchain 3.0: Focused on decentralized applications in areas such as healthcare, governance, IoT, supply chain, economics, and smart cities, utilizing platforms like Ethereum and Hyperledger for smart contracts.
- Blockchain 4.0: Emphasizes services like real-time distributed public ledgers and databases, utilizing smart contracts. (Ikhsan, 2023)

Figure 1. Blockchain Revolution



Source: Nurul Ikhsan; Blockchain zakat in zakat management organizations, is it necessary? Journal of Enterprise and Development (JED) Vol. 5, No. 3, 2023

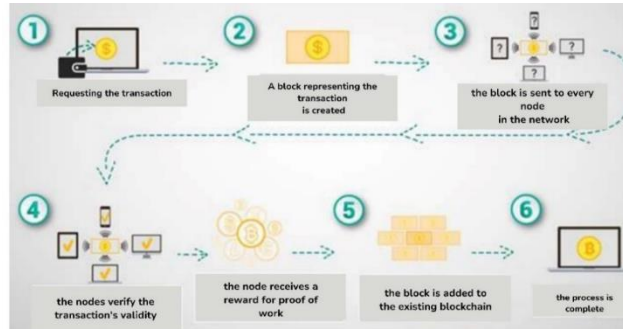
1.3 Genesis of Blockchain:

Blockchain's evolution spans various stages, beginning with encryption technology concepts in 1976, leading to the distributed ledger idea. In 1983, David Chaum introduced digital cash with encrypted blind signatures. The foundational concept of blockchain emerged in 1991 for timestamping documents, evolving with Merkle trees in 1992. The breakthrough occurred in 2008 with Satoshi Nakamoto's Bitcoin paper, revolutionizing sectors. In 2014, blockchain dissociated from currency, showcasing its potential for financial transactions. (Rahmani, 2021)

1.4 How Blockchain Works

Blockchain ensures secure and manipulation-resistant transactions directly between participants, eliminating the need for a central intermediary. Its decentralization, distributing data across network nodes, sets it apart from centralized storage methods. (Nouri & Chetoh, 2022) This can be illustrated in the following figure:

Figure 2: How Blockchain Works



Source : Rahman, Mahmoud. "Blockchain Technology and Its Role in Financing and Managing Endowments," Economic Al-Bushra Magazine, Issue 3, December 2021

Blockchain transactions ensure security and prevent manipulation by bypassing central intermediaries, relying on verification by contracts or managing entities. The technology's decentralization, distributing data across network nodes, sets it apart from traditional centralized storage methods.

1.5 Benefits and Advantages of Blockchain

Blockchain technology, recognized for continuous development, offers enhanced security through unchangeable, encrypted records, preventing fraud and addressing privacy concerns: (arabic forex, 2021)

- **Enhanced Security:** Unchangeable, encrypted records prevent fraud.
- **Decentralization:** Data distributed across nodes, not reliant on a central authority.
- **Traceability:** Creates a traceable path verifying each step's origin.
- **Cost Savings:** Significantly reduces costs while maintaining efficiency.

2.Types of Blockchains

There are three types of blockchains, with some considering three by including the consortium in private chains:

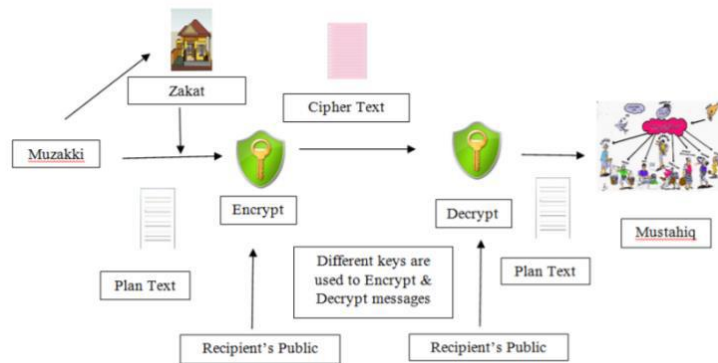
- **Public Blockchain:** Open database without a single owner, e.g., Bitcoin; lower security, expensive, and lacks privacy.
- **Private Blockchain:** Restricted access, controlled by a single founder or group; may include federated or consortium blockchains.
- **Hybrid Blockchains:** Open to a distinguished group in a closed system; highly secure, adapts rules, and offers flexibility in data transparency.

3.Zakat Management System Based on Blockchain Technology

Economists, led by Dr. Ziad Mohammed Al-Amidi, promote blockchain for Zakat management, aiming to overcome traditional collection challenges. Institutions such as the International Center for Islamic Finance Education and IE Business School underscore blockchain's potential, offering secure and transparent Zakat transactions. This aligns with blockchain principles, ensuring efficiency and trustworthiness in Zakat management. (Muhammad Nur, Muhammad Salikin, & Norzariyah, 2021)

Figure 3: Structure of the Zakat Collection System based on Blockchain

Technology



Source: Muhammad Nur Aqmal bin Khatiman, Muhammad Salikin bin Ismail, Norzariyah Yahya Blockchain-based Zakat Collection to Overcome the Trust Issues of Zakat Payers, International Journal on Perceptive and Cognitive Computing (IJPCC) 2021.

4. Some Successful Experiences of Zakat Systems Based on Blockchain

In the current scenario, digital currency acceptance for Zakat in Islamic institutions is limited due to uncertainties and differing opinions among scholars. However, successful blockchain-based Zakat systems include:

- Global Sadaqah, in collaboration with SINEGY and Luxtag in Malaysia, facilitates Zakat collection in digital currencies through blockchain, streamlining transactions with participating banks.
- The Ramadan Mosque in London leads Zakat acceptance in cryptocurrency, swiftly converting it to British pounds to manage valuation fluctuations and attract a global donor base.
- The International Federation of Red Cross and Red Crescent Societies (IFRC), guided by Dr. Ziad Mohammed, introduces a blockchain application, simplifying Zakat collection. Users choose Zakat or Sadaqah, specify their school of thought, select a purpose, and securely complete payments through a gateway. (Hamdani, 2020).

The Fourth Axis: Analytical Study of the Malaysian Experience

1. Evolution of the Malaysian Zakat System

In Malaysia, the Zakat system evolved after independence in 1957, initially returning collection and disbursement to state Sultans. The Islamic administration law in 1960 regulated Zakat under State Religious Councils. In 1974, 'Baitulmal' was established in Kuala Lumpur for Zakat distribution. The 'Taqwaa Foundation' in the early nineties, under the Islamic Affairs Council, focused on Zakat collection and initiated long-term projects for economic development, ensuring funds reached the deserving poor and needy under continuous Islamic institution supervision.

2. Zakat Management System in Malaysia

The following table illustrates the organization of the Zakat management system in Malaysia.

Table 4: Zakat Management System in Malaysia"

Number	Types of Zakat Management Systems in Malaysia	Examples of Centers Following the System
1	Completely Independent Zakat Centers, managing both Zakat collection and distribution independently.	- Selangor Zakat Board, Selangor Islamic Religious Council. - Pulau Pinang Zakat Management Center, Pulau Pinang Islamic Religious Council. - Sarawak Baitulmal Fund, Sarawak Islamic Religious Council.
2	Zakat Centers responsible for Zakat collection, with the council handling distribution.	- Zakat Collection and Recovery Center, Federal Territory Islamic Religious Council of Kuala Lumpur. - Felda Jengka Zakat Collection Center, Pahang Islamic Religious Council and Malay Customs. - Melaka Zakat Center, Melaka State Islamic Religious Council. - Negeri Sembilan Zakat Center, Negeri Sembilan Islamic Religious Council.
3	Islamic Religious Councils responsible for both Zakat collection and distribution.	- Kedah Zakat Department, Kedah State Islamic Religious Council. - Sabah Islamic Religious Council. - Johor Islamic Religious Council. - Perlis Islamic Religious Council and Malay Customs. - Perak Islamic Religious Council and Malay Customs.
4	Presence of Privatization in Zakat Centers, lacking absolute autonomous rule.	- Terengganu Islamic Religious Council and Malay Customs.

Source: Compiled by Azman bin Abdul Rahman and Mohamed Azaldin Abdul Aziz in the Role of Zakat Institutions in Addressing Poverty under the Economic Development Program:

➤ **The Selangor Zakat Board in Malaysia as an Example**

In Malaysia, Zakat institutions, such as the Selangor Zakat Board and Pulau Pinang Zakat Management Center, operate under a privatization model, managing both Zakat collection and distribution within their respective states.

3. Zakat Collection in Malaysia

In Malaysia, Zakat collection has shown significant growth, increasing from 500 million Malaysian Ringgit in 1999 to 2.5 billion in 2013, indicating a consistent upward trend. Al Jazeera reported that the Zakat fund in federal territories recorded around 112 million dollars in 2011, aiming for 120 million dollars in 2012. The number of Zakat payers, both individuals and institutions, surpassed one hundred thousand in 2011, including 1571 companies, compared to about 89 thousand in 2010. The annual growth rates from 1999 to 2013 remained positive, with Zakat as a percentage of GDP continuously increasing, driven by advancements in electronic payment methods, including blockchain platforms like FINTERRA WAQF CHAIN and GLOBAL SADAQAH.

Figure 4: Total Zakat Collection in Malaysia

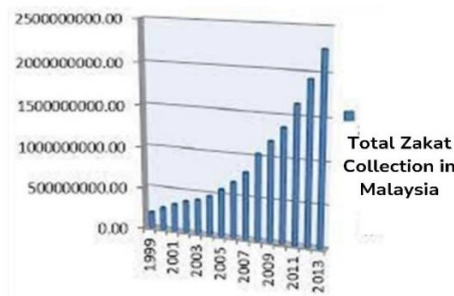
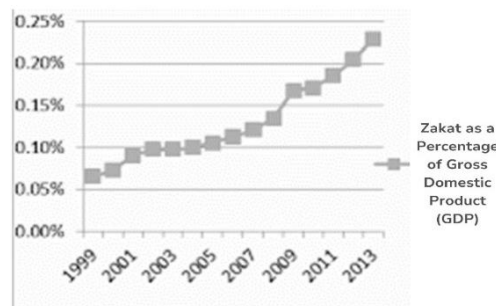


Figure 5: Zakat as a Percentage of Gross Domestic Product (GDP)



Source of Figures: Khalil Abdul Qadir and Abdli Idris, "Zakat as a Tool of Financial Policy and its Role in Some Economic Activity Indicators," Al-Bahith Journal 2015.

In Malaysia, Zakat collection significantly contributes to a 0.51% annual increase in economic growth and a 0.26% reduction in unemployment, positioning it as a vital financial policy tool. The effective management systems of Zakat funds play a positive role in influencing overall economic indicators, with institutions adopting information technology, including blockchain, to enhance trust and impact economic

dynamics. In contrast, the Algerian Zakat experience is still emerging, evident in Zakat's GDP percentage in 2013, which remained below 0.00688 due to a prevailing lack of trust in Zakat funds.

Table 4. Zakat Collection in Malaysia from the Year 2016 to 2020

Year	2020	2019	2018	2017	2016
Johor	300,855,626.51	311,727,367.23	285,784,094.35	260,671,607.01	250,436,479.20
Kedah	217,913,020.82	206,055,559.61	183,556,547.63	170,030,088.00	140,448,128.00
Kelantan	202,654,987.00	195,138,060.00	183,034,916.35	179,303,841.00	162,678,760.00
Melaka	100,720,991.88	98,838,098.55	87,815,011.74	85,598,531.92	70,537,675.73
N.Sembilan	157,160,528.43	141,521,193.35	131,116,487.35	124,495,635.43	104,760,388.36
Pahang	165,260,316.30	167,220,290.72	138,696,397.46	133,655,623.03	122,248,982.33
P.Pinang	130,875,632.57	121,432,704.21	119,734,212.91	101,454,432.72	96,781,464.11
Perak	91,633,580.59	207,187,053.49	176,246,175.19	170,804,837.16	151,181,069.12
Selangor	912,956,543.00	855,137,860.00	793,679,701.00	757,112,779.00	673,736,282.00
Terengganu	185,104,612.29	178,654,905.67	160,718,725.50	137,949,523.03	133,360,064.38
Sabah	101,788,328.22	88,997,519.92	79,661,792.60	88,318,640.61	63,704,056.64
Sarawak	110,374,938.58	105,963,561.49	-	92,301,440.00	72,082,740.00
Wilayah	758,059,087.86	688,405,441.00	657,428,211.00	621,414,431.00	589,296,523.84

Source: Yahaya, Solehah & Halim, Siti. (2022). THE ROLE OF ZAKAT IN WEALTH PROTECTION AND POVERTY ERIDICATION TOWARD SUSTAINABLE DEVELOPMENT GOALS (SDGs); International Journal of Zakat and Islamic Philanthropy

Table Analysis The table analysis reveals a consistent rise in Zakat revenues in Malaysia from 2016 to 2020, with collections increasing from around 1.4 billion Malaysian Ringgit in 2016 to approximately 2.1 billion Malaysian Ringgit in 2020. This growth is credited to heightened awareness and confidence among Malaysia's Muslim population, as well as effective management of the Zakat fund. Annual financial reports affirm that Zakat funds have been efficiently distributed to the needy, particularly during recent years and the pandemic. (Yahaya, 2022)

Conclusion

The Zakat system in Algeria, despite its importance and dynamism, faces challenges, leading to a decline in trust. Issues include accusations, lack of independence, ties to ministries, and randomness in collection and distribution. This study aims to modernize the fund through contemporary programs, leveraging technological advancements like blockchain for enhanced security, transparency, decentralization, and cost reduction. Blockchain, known for encrypting transactions and automating tracking, is seen as a revolutionary solution, ensuring the integrity of Zakat transactions and fostering transparency in the entire institution.

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