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Overcoming barriers to optimizing cash waqf linked sukuk: A DEMATEL-ANP approach

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ABSTRACT

The Indonesian government has promoted Cash Waqf Linked Sukuk (CWLS) as an Islamic Social Finance (ISF) initiative. However, as of 2023, only four CWLS series had been issued, with sales falling short of their potential. This study investigates the factors behind low CWLS sales using the Decision Making Trial and Evaluation Laboratory (DEMATEL) and the Analytic Network Process (ANP) methods to analyze the interrelationships between various barriers to CWLS adoption. Primary data was collected from experts in Islamic finance, waqf management, and regulatory institutions through structured interviews and surveys. The DEMATEL method was used to identify cause-and-effect relationships among factors, while ANP ranked the barriers in terms of their significance. The findings reveal that public distrust in CWLS managers (0.052630) is the main issue, followed by concerns about professionalism (0.049331), literacy (0.044858), transparency (0.044482), and competitiveness (0.027556). Based on these findings, the study proposes strategic solutions such as governance standardization, Nazhir certification, and improved public literacy initiatives. These insights offer actionable implications for policymakers, Islamic financial institutions, and waqf stakeholders, providing a practical roadmap to enhance participation, governance, and competitiveness in CWLS and similar Islamic finance instruments. Although technological solutions were not explored, the study provides five strategic recommendations for improving CWLS sales.

1. Introduction

Islamic social finance is an instrument that has a significant role in encouraging economic growth (Ryandono et al., 2021). One of the social financial instruments that is not only a religious institution worth worshiping but also has a dual role in improving welfare is waqf (Ascarya et al., 2023; Kahraman, 2021; Maryam et al., 2023). In Indonesia, waqf is divided into 2: waqf land and cash waqf. Waqf Land refers to the dedication of land or immovable property for charitable, religious, or public welfare purposes under Islamic law (Mat Hassan et al., 2021). The primary objective of land waqf is to generate perpetual benefits for a community, such as establishing mosques, schools, or hospitals, while ensuring the property itself remains preserved and cannot be sold or inherited. Cash Waqf, on the other hand, involves the donation of cash rather than physical assets (Alshater et al., 2022). The principal cash is invested or used in permissible ways to generate income, which is then used for charitable purposes.

This study focuses on cash waqf rather than land waqf due to its distinct advantages and relevance to financial innovations (Hosen et al., 2022). Cash waqf offers greater flexibility for individuals to contribute, as it allows smaller donations compared to the larger assets typically required for land waqf. Moreover, cash waqf can be seamlessly integrated with Islamic financial instruments like sukuk, creating opportunities for productive investments that land waqf cannot support

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(Ascarya, 2022). However, this study prioritizes cash waqf due to its compatibility with modern financial ecosystems, which align with the goals of enhancing waqf's role in economic and social development. This focus is critical for addressing the barriers to optimizing CWLS, which serves as a transformative tool for Islamic philanthropy.

Cash waqf is a contemporary and modern form of waqf management, whereas previously, people only recognized traditional or land waqf. Cash waqf has the advantage of providing flexibility for the community to be able to endow waqf, where people can have small assets to endow. With such flexibility, cash waqf is expected to be a solution to provide philanthropic funds to improve the community's welfare. However, facts show that cash waqf collection is still a fundamental problem. Cash waqf can reach USD 12 billion annually, but data shows that the realization of cash waqf only reaches USD 180 million by 2024, or only 1.5 % of its potential (BWI, 2024).

Cash Waqf Linked Sukuk (CWLS) is an Islamic social finance initiative that the Indonesian government is currently promoting. CWLS attempts to assist in gathering social funds in the form of cash waqf in the form of Sharia investment, specifically sukuk (Bank Indonesia, 2021). The goal of CWLS integration is to get people to use waqf in useful ways so that everyone can live better in many areas of growth, like health, education, infrastructure, social issues, and the economy. It was first issued in March 2020 and had an initial issuance worth USD 3.21 million. Until 2022, seven CWLS series were issued, totaling USD 25.21 million, representing just 0.115 % of Indonesia's total sukuk assets, which stand at USD 22 billion (BWI, 2024).

On the other hand, data reported in the Islamic Finance Development Indicator 2023, published by LSGE, 2023, shows that Indonesia ranks third in the number and volume of sukuk issued and outstanding, with total assets of USD 22 billion. In other words, the CWLS only reached 0.115 % of the total sukuk in Indonesia. However, CWLS transactions in Indonesia remain relatively low compared to other investments such as government bonds, shares, retail sukuk, and mutual funds. Based on data from the Financial Services Authority (OJK), the amount of state sukuk issuance reached USD 20.8 billion, and the amount of corporate sukuk issuance reached USD 3.02 billion; on the other hand, mutual funds managed assets worth approximately USD 37.85 billion. In 2023, retail sukuk transactions are projected to reach.

This significant difference shows challenges in optimizing CWLS instruments, such as a lack of socialization (Maulina et al., 2024), Sharia financial literacy (Kachkar & Alfares, 2022), and limited public access to this financial product (Afifah & Iqbal, 2022; Supyadillah & Arif, 2025). Apart from that, challenges regarding regulations and infrastructure that are not yet fully supportive are also obstacles to optimizing CWLS (Putra et al., 2023). Therefore, further efforts are needed to increase education and outreach regarding CWLS and strengthen regulations and infrastructure to encourage public participation in this Sharia financial instrument (Afifah & Iqbal, 2022).

Research related to CWLS is minimal and limited, thus requiring more attention in academic literature. Most of the existing research focuses on descriptive analysis and the economic potential of CWLS, but none has explored specific aspects of the problem. For example, research by Rusydiana et al. (2023) only describes the development and sentiment towards CWLS in Indonesia. Examining from the perspective of the upper middle class, Maulina et al. (2022) found that trust in the Indonesian Waqf Board (BWI) is the main factor in giving waqf under the CWLS scheme. One study explores the problems and solutions of CWLS, namely the study conducted by Afifah and Iqbal (2022). The research categorizes the challenges into three main aspects: collection, management, and reporting. However, this study does not explain the causal relationship between barriers.

This research aims to fill this gap by using the DEMATEL ANP method to identify and prioritize key issues in CWLS implementation. DEMATEL helps eliminate criteria that lack significant relationships, simplifying the decision-making process by setting a threshold. This makes it easier for decision-makers to make complex decisions by focusing on certain criteria with a causal relationship. This aligns with the research objective of formulating a revitalization policy to improve the effectiveness and efficiency of CWLS transactions. This approach has never been done before and is expected to provide strategic guidance for stakeholders to improve the effectiveness and efficiency of CWLS. This method is ideal for analyzing problems and formulating solutions, making it a valuable tool for decision-making. Researchers then combined DEMATEL with ANP, as ANP simplifies complex solutions and strategies by prioritizing them. This research used five aspects, namely: 1) Literacy; 2) Trust; 3) Professionalism; 4) Transparency; and 5) CWLS Competitiveness. The opinions of experts in the field of waqf can disentangle the effects of subjectivity so that the results of this research can be used to determine policy.

2. Literature review

2.1. CWLS in theory and practice

Cash Waqf Linked Sukuk (CWLS) is a Sharia social financial instrument that combines elements of commercial and social finance, which aims to help collect social funds in the form of cash waqf in the form of Sharia investment, namely sukuk (Bank Indonesia, 2022). CWLS clearly displays the characteristics of blended financing. First, this approach involves diverse funding sources, ranging from philanthropic donations in the form of cash waqf to sukuk investments from the private sector (Rochani et al., 2021). This combination helps reduce project risks by sharing the financial burden among various parties and utilizing diversification to increase the financial security of the project. CWLS is a variant of sukuk, which functions to direct funds from investors for sustainable social projects such as building schools, hospitals, or other public infrastructure. Through active community participation and the application of Islamic values such as justice and togetherness, these two concepts play an important role in building a sustainable economic foundation that is oriented towards the welfare of the people. Second, by leveraging philanthropic funds to attract commercial investment, CWLS applies the principle of effective leverage to increase the total amount of funds available for social purposes (Pratama et al., 2023).

Indonesia has emerged as a pioneer in implementing CWLS. At the same time, countries like Malaysia and Saudi Arabia have also made substantial strides in integrating waqf with sukuk for economic empowerment and public welfare. In Indonesia, CWLS has been framed as a mechanism to mobilize cash waqf for national development, particularly after the COVID-19 pandemic, with studies indicating its potential to support social facilities and economic recovery (Sulaeman et al., 2022). The findings from Sulaeman et al. emphasize the need for refining CWLS frameworks to optimize their usage in funding critical initiatives while addressing internal and external constraints (Sulaeman et al., 2022). Additionally, Ismal (2022) discusses the operational aspects of CWLS and notes that public engagement and awareness remain relatively low.

The Indonesia government's issuance of the CWLS SWR001 series is an innovative step in integrating sukuk and waqf in the field of Sharia finance. There are two types of sukuk-waqf, namely linked waqf sukuk and linked waqf sukuk. The government uses a sukuk-linked waqf scheme to issue SWR001. The results of this investment will be used to provide social facilities for the congregation. SWR002 was published in March 2021; the aim is still the same as the previous series, namely, to provide funds for social projects that benefit society. The last CWLS publication carried out by BI was SWR004 in 2023. One of the main programs that BWI wants to target is related to food security programs through empowering farmers and breeders. Thus, using CWLS investment, the returns received can have a positive impact on various levels of society, and it is hoped that it can become a sustainable investment (Mochtar & Ramadhan, 2024).

In contrast, Malaysia has demonstrated a successful application of cash waqf within its financial system by leveraging sukuk for sustainable

investment. Kunhibava et al. (2023) highlight Malaysia's structured legal and regulatory framework that facilitates the implementation of CWLS, enhancing its viability compared to Indonesia's structure, which is still developing. Malaysia Sukuk Sustainable and Responsible Investment (SRI) serves as a model, illustrating effective integration of social investment principles with private financing, which could provide valuable lessons for Indonesia (Taqwiem & Rachmadi, 2023).

Furthermore, Saudi Arabia's initiatives, such as the King Abdul Aziz Waqf, showcase the potential of utilizing cash waqf-linked sukuk to develop large infrastructure projects, indicating a more advanced application than that seen in Indonesia (Taqwiem & Rachmadi, 2023). This comparative perspective illustrates that while Indonesia is making significant strides, other countries are capitalizing on similar frameworks more effectively, highlighting the need for Indonesia to optimize its CWLS model by learning from the best practices of these nations.

2.2. Barriers identified in literature

Institutional Theory, as articulated by Dimaggio and Powell (2004), emphasizes how formal rules, social norms, and institutional environments shape organizational behavior. In the context of CWLS, this theory is relevant for understanding how regulatory frameworks, organizational legitimacy, and normative expectations condition public trust and professionalism in waqf management. Institutional weaknesses—such as the absence of standardized governance procedures, underdeveloped supervision mechanisms, and insufficient Nazhir qualifications—reflect a lack of coercive, mimetic, or normative institutional isomorphism. These institutional deficiencies may contribute to public skepticism and reduced engagement with CWLS.

Furthermore, Behavioral Finance Theory, particularly as discussed by Thaler (2016), provides insight into how psychological biases affect financial decision-making. Trust and transparency in CWLS are not only influenced by rational assessments but also by perceptions, heuristics, and prior experiences. For instance, the availability heuristic may cause potential donors (wakif) to overemphasize isolated cases of waqf fund mismanagement. At the same time, loss aversion may lead them to avoid CWLS due to uncertainty about returns. These behavioral biases can undermine participation, even in the presence of improved governance structures.

Good *Nazhir* governance includes strategic objectives, control environment, waqf knowledge, management, Sharia compliance, and the responsibilities of the waqf institution board. In Indonesia, Good *Nazhir* Governance is represented by the presence of Waqf Core Principles (WCP). Waqf Core Principles (WCP), which were formed in 2018 by the Indonesia Waqf Board (BWI), Indonesia Bank, and the International Research and Training Institute-Islamic Development Bank (IRTI-IsDB), serve as a reference document for waqf management in the legal system in Indonesia (BWI IRTI & IDBs, 2018). The aim of establishing the WCP is, first, to provide a concise description of the position and role of waqf management and supervision in economic development. Second, providing encouragement for a methodology that contains the core principles of management and supervision of waqf governance. WCP implementation is divided into five dimensions with 29 WCP points. The WCP dimensions consist of legal foundations (WCP 1 – WCP 6), waqf supervision (WCP 7 – WCP 12), good Nazhir governance (WCP 13), risk management (WCP 14 – WCP 25), and Sharia governance (WCP 26 – WCP 29). This research will focus on discussing the dimensions of Good *Nazhir* Governance in WCP 13.

The implementation of CWLS in Indonesia is very relevant to the WCP principles, which include legal foundations, waqf supervision, good governance, risk management, and Sharia governance. The WCP aims to guide practical Standard Operating Procedures (SOPs) in waqf management, including the initiation of Nazhir certification with monitoring and evaluation support from BWI at various levels. These principles support the development and optimization of waqf assets through instruments such as CWLS, which combines waqf funds with Sharia investments to achieve greater social and economic benefits.

The presence of CWLS in Indonesia is closely related to the values in the WCP, which include legal foundations, waqf supervision, good governance, risk management, and Sharia governance. CWLS is a social finance instrument that integrates waqf and sukuk to provide sustainable benefits. In theory, the WCP can provide a structured framework to assess aspects of governance, sustainability, and impact on society. The integration of CWLS and WCP demonstrates collaboration on how traditional waqf concepts can evolve to meet contemporary needs.

2.3. Gaps addressed by this study

CWLS provides flexibility in collecting waqf funds, both temporarily and permanently, so that it can attract wide interest from waqifs who want to contribute to social and economic development in Indonesia. The publication of CWLS, such as the SWR002 series in 2021, shows a significant increase in public and investor interest, especially from millennials. This series succeeded in attracting total subscriptions of IDR 24,141 billion (US$1.67 million), with the participation of 217 millennial investors who placed orders amounting to IDR 3.53 billion (US $0.24 million), illustrating the high enthusiasm despite the COVID-19 pandemic situation at that time (Bank Indonesia, 2022). CWLS and community interest correlate with its significant contribution to social and economic development and transparent and effective management of waqf funds. CWLS not only provides an opportunity to invest with profitable Sharia principles but also encourages awareness and active participation from the community, especially the millennial generation, in advancing the national cash waqf movement.

The exploration of CWLS serves as a significant nexus within Islamic finance, specifically relating to waqf-based initiatives and their role in economic and social development. However, there is a prevailing concern regarding the relative underperformance of CWLS sales. Prior studies have cataloged both theoretical frameworks and empirical analyses that pinpoint underlying issues affecting the efficacy of CWLS as a financial instrument.

A pivotal study by Wulandari et al. (2022) emphasizes the psychological aspect of consumer behavior regarding CWLS, asserting that the public's intention to invest is notably influenced by social norms, especially those originating from close relations such as family and friends. The research elucidates that increased visibility and discussion of CWLS within social circles significantly enhance public interest in purchasing. However, this research does not delve into the complex interplay of various barriers affecting investment decisions. It does not establish a clear ranking or prioritization of these barriers using advanced methodologies.

Aside from perceptual dynamics, significant studies elucidate the economic ramifications of CWLS, particularly noting its potential to foster social welfare. For instance, studies by Humaidi et al. (2023) underscore the integration of waqf funds into CWLS as a strategy to support micro, small, and medium enterprises (MSMEs), pointing to its function as a capital catalyst for economic activities while enhancing community welfare. Moreover, Kunhibava et al. (2023) assert that CWLS serves as an alternative financing method essential for reviving the economy and bolstering social programs, particularly during crises such as the COVID-19 pandemic. However, this study lacks a structured approach to comprehensively synthesize the findings of multiple barriers. This leads to missed opportunities for combining findings into an effective analytic toolkit that stakeholders could leverage.

The work by Rusydiana et al. (2023) discusses the potential of CWLS in invigorating economic development through effective funding strategies, reflecting its multifaceted utility within holistic economic frameworks. This notion brings to light the findings of Yasin (2021), who highlights several hurdles that inhibit public engagement with CWLS, such as the preference for zakat, *infaq*, and *shodaqah* over waqf contributions. Addressing these challenges is crucial for optimizing CWLS's role in socio-economic development. Thus, further research into

behavioral economics, particularly focusing on enhancing public literacy and trust regarding waqf management, can mitigate some of these barriers (Izzah & Soemitra, 2022).

Conversely, while several studies unveil both descriptive narratives and theoretical constructs surrounding CWLS, there exists a palpable gap—a lack of comprehensive empirical analyses that integrate these narratives into a cohesive pedagogical framework. Research by Setyomurni and Nashirudin (2023) echoes this sentiment, suggesting that more extensive explorations are warranted to unpack the potential of CWLS in connecting microfinance, community welfare, and national economic recovery efforts, emphasizing the need for empirical observation in these discussions. Furthermore, investigations into the structural contexts, specifically regulatory measures, also highlight areas for enhancement regarding the efficacy of CWLS as a vehicle for social change (Rabbani et al., 2023). Lastly, the literature surrounding CWLS mandates an intersectional analysis that probes into sociocultural dimensions, policymaking, and procedural efficiencies as determinants of successful implementation. In this regard, Mustapha et al. (2023) call for integration between CWLS mechanisms and developments in sustainable socio-economic frameworks, indicating pathways to address current shortcomings while fostering a dialogue on future trajectories.

Prior studies, such as those by Rusydiana et al. (2023), Maulina et al. (2022), and Afifah and Iqbal (2022), typically described challenges broadly or categorized them without explaining their interrelations comprehensively. In contrast, this study explicitly reveals interdependencies and identifies public distrust as the primary obstacle, followed by professionalism, literacy, transparency, and competitiveness. Thus, it moves beyond merely listing challenges to demonstrating the systemic and interconnected nature of these issues. Moreover, Sulaeman et al. (2022) employ SWOT analysis to assess the CWLS mechanism for Indonesia's post-COVID economic recovery, capturing external and internal factors but failing to establish a quantitative analysis of their interactions using more methodical approaches.

Unlike previous studies, which primarily offered descriptive analyses or assessments of CWLS economic potential without deep exploration of causal relationships (Afifah & Iqbal, 2022), this research employs the integrated DEMATEL-ANP methodology. The DEMATEL method identifies cause-and-effect relationships among barriers, clarifying how each aspect (literacy, trust, professionalism, transparency, competitiveness) interacts and influences CWLS implementation. The ANP method further prioritizes these identified barriers, offering a clear, hierarchical understanding of their significance.

The literature search found that five aspects influence the success of CWLS. Table 1 explains the definitions of each aspect. In this study, each aspect is built on several indicators. Details of the indicators can be listed in Appendix A.

Table 1
CWLS problem aspects.

Aspect	Definition	Source
Literacy (L)	The degree of awareness, understanding, and knowledge that individuals and organizations have regarding the CWLS program. This encompasses: a. Public understanding of CWLS; b. Knowledge of the CWLS program; and c. Coordination between stakeholders and educational institutions.	(Berakon et al., 2022a; Masrizal et al., 2023; Sukmadilaga et al., 2021)
Trust (K)	The confidence and belief that stakeholders, particularly donors and investors, have in the CWLS framework, its management, and its intended outcomes. This encompasses: a. Credibility of managing institutions; and b. Reliability of financial instruments	(Allah Pitchay, 2022; Berakon et al., 2022a; Haidlir et al., 2023)
Professionalism (P)	Institution or Nazhir's competency to create a successful program.	(Afifah & Iqbal, 2022; Kachkar & Alfares, 2022; Monica et al., 2020)
Transparency (T)	The openness and clarity with which information about the CWLS program is communicated to stakeholders, including donors (waqifs), investors, and the broader public.	(Berakon et al., 2022a; Daud, 2019; Hasan et al., 2022)
CWLS Competitiveness (C)	The ability of CWLS to offer returns and benefits that are comparable to or exceed those of other investment instruments, thereby attracting and retaining investors	(Ahmad, 2019; Hosen et al., 2022; Noordin et al., 2017)

3. Methods

This research uses the DEMATEL-ANP method to analyze the low level of public interest in Cash Waqf Linked Sukuk (CWLS) from the perspective of experts in the field of waqf. Through this method, this research identifies the problems that cause low interest in CWLS and then formulates appropriate solutions and priority strategies. The selection of solutions and priority strategies was carried out with the help of the ANP method, while the DEMATEL method was used to strengthen and validate the research model framework. DEMATEL and ANP are part of MCDM (Multi-Criteria Decision Making), which is a method for solving complex problems with high uncertainty and with many perspectives (Büyüközkan & Güleryüz, 2016). In this way, priority solutions and strategies with strong validity and significance will be produced by integrating the DEMATEL and ANP methods.

Decision Making Trial and Evaluation Laboratory (DEMATEL) is a method first developed by the Battelle Memorial Institute (BMA) in 1971. DEMATEL is a method that analyzes causal relationships between various criteria. When making decisions based on many criteria, using the DEMATEL method becomes profitable. DEMATEL will eliminate several criteria that do not have a significant relationship by determining the threshold (Du & Li, 2021). This will make it easier for decision-makers to make complex decisions by focusing on certain criteria that have a causal relationship.

On the other hand, the Analytic Network Process (ANP) was developed by Saaty and Vargas in 1996 (2006). The urgency of using the ANP method in this research is to synthesize opinions from all experts with various backgrounds regarding the problem of low interest in CWLS (Fei, 2020). In addition, ANP is used to summarize the complexity of solutions and strategies that have been formulated into priority solutions and strategies (Yeo et al., 2020).

To contextualize the methodological value of DEMATEL-ANP, it is useful to compare it with commonly employed alternatives in multi-criteria decision-making and problem analysis. Unlike SWOT, which offers a qualitative and often subjective strategic framework, DEMATEL-ANP provides a systematic, expert-driven quantification of causal relationships and priority setting. AHP is frequently used for prioritizing hierarchical criteria but assumes independence among factors, whereas ANP (as used in this study) accommodates interdependence. Regression analysis, while robust in testing statistical associations, does not reveal the directional or systemic influence among non-numeric and interrelated barriers. DEMATEL-ANP is particularly suited for complex, semi-structured decision environments like CWLS implementation, where factors are interrelated, qualitative, and expert-informed. Table X summarizes these differences (Table 2).

Thus, DEMATEL-ANP is the most considered method in this research because it is considered the most capable of answering the problem formulation related to the analysis of problems and priority solutions in the development of CWLS. DEMATEL-ANP is a model integration that complements the existence of causal relationships so that DEMATEL can

Table 2
Method comparison.

Method	Type	Handles Interdependence	Causal Analysis	Quantitative Output	Ideal For
SWOT	Qualitative	×	×	×	Strategic overviews
AHP	Quantitative	×	×	✓	Hierarchical prioritization
ANP	Quantitative	✓	×	✓	Prioritization with feedback
DEMATEL	Quantitative	✓	✓	✓	Cause-effect mapping
Regression	Statistical model	✓ (limited to variables)	✓ (via coefficients)	✓	Predictive/statistical analysis
DEMATEL-ANP (this study)	Hybrid (Quantitative, Expert-based)	✓	✓	✓	Complex, interrelated decision structures (e.g., CWLS barriers)

Source: Author

eliminate bias in the ANP method that relates the network between criteria. With this, complex decision-making criteria can be structured with more focus and direction.

3.1. Research data collection

This research uses primary data sourced from focus group discussions, in-depth interviews, and paired comparison questionnaire assessments with CWLS experts. The stages of this research are as follows: First, gather information about problems in CWLS with various experts in the fields of academics, practitioners, associations, and regulators by holding focus group discussions and in-depth interviews. The research framework based on the results of FGDs and in-depth interviews will be built by determining criteria and sub-criteria. In this second stage, research instruments were also developed. Second, after the researcher has developed the research framework and instruments, in-depth interviews with expert representatives are carried out to revalidate the framework and instruments that have been prepared. Third, the preparation and assessment of the DEMATEL questionnaire by respondents. The questionnaire is made in matrix form with a rating scale of 0–4, where the value 0 is no influence, 1 is very low influence, 2 is medium influence, 3 is high influence, and 4 is absolute influence.

Fourth, the results of the DEMATEL questionnaire will be analyzed to build the ANP framework. The DEMATEL calculation formula is as follows:

1. Normalize the direct-relation matrix
2. Normalizing the average matrix

$$S = \max_i \sum_{j=i}^{n} aij$$

$$N = \frac{Z}{S}$$

3. Calculating the total relation matrix

$$T = \lim_{k \to \infty} \left(N + N^2 + \ldots + N^k\right) = N\,(1 - N)^{-1}$$

4. Computing the Levels of Influence and Effect. Vectors c and r represent the number of columns and rows of matrix T, respectively. Both c and r indicate the degree of direct and indirect effects and influences between elements in a system.

$$c_j = \sum_{i=1}^{n} t_{ij}$$

$$r_i = \sum_{i=1}^{n} t_{ij} \quad (1)$$

Calculating the influence and relationship vectors. In this calculation, the causal relationship is determined by r–c. A positive r–c value indicates the position of the cause, while a negative r–c value indicates the position of the effect. In other words, if criterion A has a positive r–c value, while criterion B has a negative r–c value, then criterion A is the criterion that influences, while criterion B is the criterion that is influenced or receives the effect of the conditions that occur in criterion A. In this study, the DEMATEL analysis was conducted using Microsoft Excel due to its flexibility in handling matrix operations, normalization, and influence calculations manually, which allowed for a transparent step-by-step computation process.

Fifth, a paired comparison questionnaire was prepared using the ANP 1–9 scale. Sixth, questionnaire assessment by respondents. In this study, respondents who assessed the ANP questionnaire were the same as respondents who assessed the DEMATEL questionnaire. Seventh, a pairwise comparison analysis will be conducted, and the inconsistency of the respondent's answers will be assessed. Respondents' answers were considered inconsistent if the inconsistency value exceeded 0.1. This research addresses inconsistencies so that it can be continued by calculating the geometric mean and rate of agreement in the eighth stage. For the ANP, the Super Decisions software was used, which is specifically designed to handle complex decision-making models involving interrelated criteria and sub-criteria. Super Decisions facilitated the construction of the network structure, pairwise comparisons, consistency ratio checks, and synthesis of priorities, ensuring methodological accuracy in deriving the final rankings of CWLS barriers and solutions.

The geometric mean is a type of average calculation that shows a certain tendency or value. On the other hand, the Rater Agreement is a measure that shows the level of conformity of respondents (R1-Rn) regarding a problem in one cluster. The tool used to measure rater agreement is Kendall's Coefficient of Concordance (W; $0 < W < 1$). $W = 1$ indicates perfect conformity. The formula for calculating the Geometric Mean and Rater Agreement is as follows.

$$GMk = (R_1 \times R_2 \times \ldots \times R_n)1 \,/\, n \quad (2)$$

where GMk is the Geometric Mean, R1 is the respondent, and n is the number of respondents

$$U = \frac{(T_1 + T_2 + \ldots + T_P)}{P} \quad (3)$$

$$S = (T_1 - U)^2 + (T_2 - U)^2 + \ldots + \left(T_p - U\right)^2 \quad (4)$$

$$MaxS = (n - U)^2 + (2n - U)^2 + \ldots + (pn - U)^2 \quad (5)$$

$$W = S/MaxS \quad (6)$$

where U = average value of the total ranking, S = sum of squared deviations, p = number of nodes, n = number of respondents.

3.2. Expert selection

The data used in this study were primary, obtained through Focus

Group Discussions (FGD) and in-depth interviews conducted both online and offline. A total of 14 participants contributed to the research, including five experts from academia, three from the practitioner sector, three from professional associations, and three from regulatory bodies. The use of DEMATEL and ANP, which put expert quality, consensus, and consistency ahead of statistical representativeness, methodologically justifies the sample size of 14, despite its apparent smallness. This strategy is in line with accepted MCDM procedures, which call for 10–20 experts for reliable modelling (Büyüközkan & Güleryüz, 2016). Since the analysis is based on structured expert judgment rather than statistical analysis in the conventional sense, a formal power analysis was not performed. In addition to evaluating internal consistency through ANP's Consistency Ratio (CR) threshold (CR $<$ 0.1), consensus was also assessed using Kendall's Coefficient of Concordance (W)—a non-parametric statistic that measures inter-rater agreement. As shown in Table 10, W-values for the most influential criteria (trust and literacy) exceed 0.75, indicating strong agreement among experts. Furthermore, consensus was reinforced through structured focus group discussions (FGDs) that allowed respondents to clarify, deliberate, and align their views on CWLS barriers and strategies prior to completing the ANP survey. This mixed approach—combining statistical indices and qualitative triangulation—ensures that the model reflects collective expert judgment rather than fragmented individual opinions.

The selection of respondents from the academic group was based on publications about waqf in general and CWLS authored by respondents published in reputable international journals. Practitioner respondents are CWLS managers who have at least five years of experience and are in managerial positions. On the other hand, expert respondents from the association group were considered because the association is the party that connects academics, practitioners, and regulators in the field of waqf due to its neutral position. Regulator respondents are respondents who have managerial positions in government and have the authority to decide the future direction of CWLS. The diversity of the experts improved the research's validity. This diversity made it possible for the model to represent both real-world field realities and policy-level insights, ensuring a comprehensive understanding of the five main themes. A list of respondents can be found in Table 3.

This study did not conduct a traditional power analysis because the DEMATEL-ANP methodology relies on qualitative expert judgment rather than inferential statistics drawn from a probability sample. In this context, the goal is not hypothesis testing, but rather the elicitation and prioritization of expert consensus. Therefore, statistical power is not applicable in the conventional sense. However, to ensure validity and methodological transparency, expert consistency ratios (CR) and Kendall's W concordance values were calculated, both of which indicated strong consensus.

Additionally, sensitivity analysis—a process commonly used to test the robustness of model outputs to changes in inputs—was not conducted in this initial study due to the discrete and expert-based nature of the data. Nonetheless, we acknowledge its importance for future research. Sensitivity analysis using Monte Carlo simulations or scenario modeling would be valuable in follow-up studies employing quantitative or hybrid datasets to test the stability of priorities under varying assumptions.

Table 3
List of expert respondents.

No	Initials	Position	Group
1	NL	Professor in Islamic Finance at Airlangga University	Academics
2	AR	Academic and Researcher at Sakarya University	
3	MIH	Academic at Airlangga University	
4	RS	Professor in the field of Waqf at Airlangga University	
5	LH	Academic at Airlangga University	
6	AJ	National Committee for Islamic Economics and Finance	Regulators
7	NH	Indonesia Stock Exchange	
8	HT	Indonesian Waqf Board	
9	MH	ITS Endowment Fund Representative	Practitioner
10	SP	Chairman of the Baiturrahmah Sejahtera Foundation	
11	WS	Chairman of the Social Fund Institution, which is active in the field of waqf	
12	BAF	Academic at Airlangga University	Association
13	ER	Commissioner of the Sharia Economic Community	
14	NV	Association of Islamic Economists	

Source: Author (2025)

4. Results

4.1. Dematel result

To determine the Direct Relationship Matrix, it is necessary to identify the value of direct influence between each pair of elements in the system under study. Based on the data provided, the following direct relationship matrix includes five elements: Literacy, Trust, Professionalism, Transparency, and CWLS Competitiveness (Tables 4 and 5).

The Initial-Direct Matrix (ID Matrix) is a matrix that shows the correlation value between each pair of criteria in the system, normalized by the value of the average matrix of direct relationship values between previously normalized criteria (see Table 6).

The Cause-Effect Matrix provides an overview of the dynamics of the cause-and-effect relationship between the criteria analyzed in the system. Factors such as Literacy, Professionalism, and Transparency have a dominant role as causes or factors that influence other factors. In contrast, factors such as Trust and CWLS Competitiveness are more likely to be the result of or influenced by other factors.

The relationship between criteria is obtained from the calculation of Ri (Cause), which is the sum of the positive values of the ID matrix, showing how much one factor directly influences other factors. Ci (Effect) is the sum of the negative values of the ID matrix, showing how much a factor is directly influenced by other factors. The total absolute influence of a factor is shown by Ri + Ci, both as a cause (Ri) and as a result (Ci). Meanwhile, Ri-Ci shows the net influence of a factor. A positive value indicates the factor is more likely to be the cause, while a negative value indicates it is more likely to be the effect.

Based on Table 7 of the cause-and-effect matrix above, the cause-and-effect relationship between the Literacy, Trust, Professionalism, Transparency, and Competitiveness CWLS criteria can be seen. The following is an explanation of each of the causal relationships between these criteria:

5. Literacy has a high Ri value of 6.98 and a lower Ci value of 6.65. This indicates that literacy has a strong influence as a cause on other factors in the system being analyzed. Literacy is important in influencing the dynamics and interactions between other criteria.
6. Trust has a high CI value of 8.11 and a lower RI value of 6.78. This shows that Trust is more likely to be influenced by other factors (effects) in this system rather than being a direct cause of other factors. This illustrates that the Trust factor in this context may be more reactive to the variability of other factors present in the environment or system being analyzed.
7. Professionalism has a high Ri value of 8.28 and a lower Ci value of 7.65. This shows that professionalism has a strong causal influence on the system, indicating that increasing professionalism can significantly influence the dynamics and performance of the system as a whole.
8. Transparency, with a Ri value of 8.21 and a Ci value of 7.47, also shows a significant influence as a cause in interaction with other factors. In this case, transparency is considered a key factor influencing relationships and performance within the system, with the potential to improve coordination and efficiency in existing processes.

Table 4
Matrix of average direct relationship values between criteria.

	Literacy	Trust	Professionalism	Transparency	CWLS Competitiveness
Literacy	0.00	2.86	2.64	2.57	2.64
Trust	2.50	0.00	2.71	2.71	2.36
Professionalism	2.71	3.50	0.00	3.57	3.36
Transparency	2.57	3.64	3.57	0.00	3.21
CWLS Competitiveness	2.29	2.79	3.00	2.71	0.00
Max value 13.14					

Source: Author, Processed Data (2025)

Table 5
Matrix of average normalized direct relationship values between criteria.

	Literacy	Trust	Professionalism	Transparency	CWLS Competitiveness
Literacy	0.0000	0.2174	0.2011	0.1957	0.2011
Trust	0.1902	0.0000	0.2065	0.2065	0.1793
Professionalism	0.2065	0.2663	0.0000	0.2717	0.2554
Transparency	0.1957	0.2772	0.2717	0.0000	0.2446
CWLS Competitiveness	0.1739	0.2120	0.2283	0.2065	0.0000

Source: Author, Processed Data (2025)

Table 6
Initial-direct matrix (matrix ID).

	Literacy	Trust	Professionalism	Transparency	CWLS Competitiveness
Literacy	1,0000	−0.2174	−0.2011	−0.1957	−0.2011
Trust	−0.1902	1,0000	−0.2065	−0.2065	−0.1793
Professionalism	−0.2065	−0.2663	1,0000	−0.2717	−0.2554
Transparency	−0.1957	−0.2772	−0.2717	1,0000	−0.2446
CWLS Competitiveness	−0.1739	−0.2120	−0.2283	−0.2065	1,0000

Source: Author, Processed Data (2025)

Table 7
Cause-effect matrix.

	Ri	Ci	Ri + Ci	Ri-Ci	Information
Literacy	6.98	6.65	13.63	0.34	Cause
Trust	6.78	8,11	14.89	−1.32	Effect
Professionalism	8.28	7.65	15.93	0.63	Cause
Transparency	8.21	7.47	15.69	0.74	Cause
CWLS Competitiveness	7.06	7.45	14.51	−0.39	Effect

Source: Author, Processed Data (2025)

9. CWLS's Competitiveness, with a Ci value of 7.45 and a Ri value of 7.06, is more likely to be influenced by other factors (effects) in the context of this analysis rather than acting as a direct cause. This suggests that CWLS's Competitiveness may be influenced by external factors or variability in the operational or market environment.

The Threshold Matrix is used to determine the threshold that differentiates between causal factors (Cause) and effect factors (Effect) based on the values listed.

Based on Table 8 of the threshold matrix above, every factor/aspect that has a value above the threshold value (more than 1.4929) will have a significant influence on other factors. Meanwhile, factors/aspects that have a value below the threshold value (less than 1.4929) will not have a significant influence on other factors (see Fig. 1).

Thus, the cause-and-effect relationship between factors/aspects of the analysis below can be described based on the explanation of the cause-and-effect matrix and threshold matrix in Tables 7 and 8 above.

4.2. ANP result

Table 9 shows the results of processing respondent data using ANP. Based on the Geomean value, the highest value is in trust, with a Geomean value of 0.0526, followed by professionalism and literacy. These three aspects of the problem are the main reasons for the low public interest in CWLS.

The DEMATEL method produces influence values that represent the degree to which one factor affects others in the system. A value of 0.0526 for the influence of "Trust" on other variables suggests a moderate-to-strong systemic influence relative to the other components in the matrix. In practical terms, this means that improving trust is likely to produce a ripple effect on other factors, such as literacy and professionalism. Influence values near zero indicate low inter-factor impact, whereas values closer to 0.1 or higher indicate dominant structural

Table 8
Threshold matrix.

	Literacy	Trust	Professionalism	Transparency	CWLS Competitiveness
Literacy	1.1229	1.5477	1.4596	1.4261	1.4261
Trust	1.2511	1.3313	1.4271	1.3983	1.3762
Professionalism	1.5030	1.8362	1.5343	1.7126	1.6977
Transparency	1.4846	1.8295	1.7350	1.4863	1.6779
CWLS Competitiveness	1.2840	1.5603	1.4931	1.4488	1.2738
THRESHOLD				1.4929	

Source: Author, Processed Data (2025)

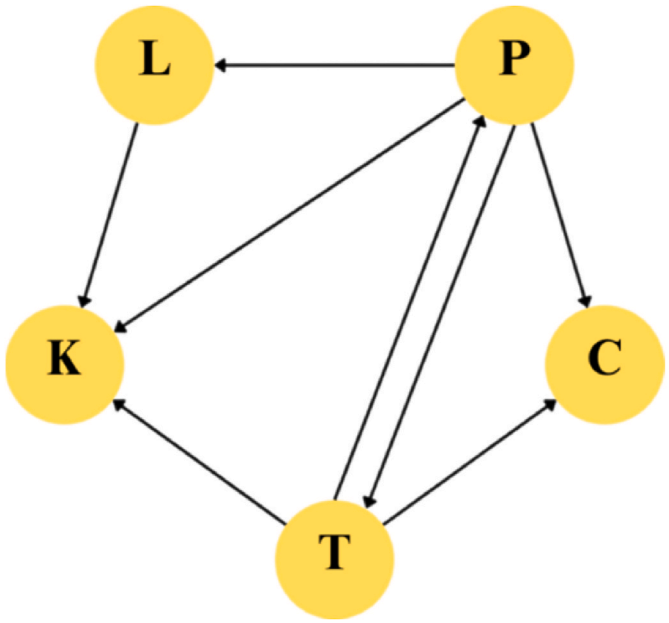

Fig. 1. Cause-effect relationship between analysis aspects.
Source: Author (2025)

drivers. These values guide stakeholders in targeting root causes that most efficiently resolve broader systemic issues in CWLS implementation.

The P-value and Weight results also support this. The weight for the literacy and trust aspects shows a figure above 0.7, which means that the trust and literacy aspects have a strong influence on people's interest in CWLS. Meanwhile, for the aspects of professionalism and transparency, the W value shows a figure above 0.4 but does not exceed 0.75. For the CWLS Competitiveness aspect, the figure shows below 0.4, which indicates that CWLS competitiveness has very little influence on people's interest in CWLS (Table 10).

In this research, each aspect has problem indicators and solutions. With ANP, problem and solution indicators for each aspect will also be ranked based on Geomean values. The priority order of problems and solutions for increasing CWLS sales is shown in Appendix A.

5. Discussion

Based on the Geomean, Weight (W), and P-Value recapitulation, the results showed that the three main problems in CWLS were trust, literacy, and professionalism. In this sub-chapter, the core problems in each aspect will be discussed in depth, as well as their solutions.

5.1. Community trust

This research proves that the problem of public trust in CWLS managers is the main reason for the low interest in waqf through the CWLS instrument. This research proves that the problem of public trust in CWLS managers is the main reason for the low interest in waqf through the CWLS instrument. Trust, in this context, is not solely a function of operational performance but is also shaped by institutional structures and behavioral perceptions. From an Institutional Theory perspective (Dimaggio & Powell, 2004), the lack of standard governance, weak regulatory enforcement, and inconsistent public reporting reflect an institutional environment that fails to enforce mimetic or coercive isomorphism. In other words, waqf institutions do not yet emulate or are not pressured to adopt widely accepted best practices, leading to a legitimacy gap in the eyes of the public.

Simultaneously, Behavioral Finance Theory (Thaler, 2016) suggests that trust is also affected by cognitive biases such as the availability heuristic, where negative news about fund misuse becomes disproportionately influential in donor decision-making. Likewise, the ambiguity effect—where decision-makers avoid options with unknown probabilities—can explain hesitation toward CWLS due to unclear or delayed return information.

Therefore, public trust must be rebuilt through both structural reforms and behavioral interventions. Structurally, CWLS managers should establish transparent and audited reporting mechanisms that are aligned with Waqf Core Principles (WCP) and institutional governance norms. Behaviorally, clear and consistent communication showcasing positive impacts and return histories can help reframe public perceptions. The top solution—increasing the standardization of governance and capacity of Waqf institutions—directly addresses both institutional deficiencies and perception biases.

The results of this research are in line with (Berakon et al., 2022b), who stated that higher trust in waqf institutions will significantly influence people's intentions to donate cash (Hasan et al., 2022). Trust in the institution is a key determinant of donors' satisfaction and their intention to continue contributing to waqf (Shukor et al., 2017). The community must feel confident that the waqf funds they donate will be managed well, transparently, and used according to the desired goals.

There are several reasons for low public trust in CWLS. First, accountability governance for CWLS reporting is not yet ideal, as is the lack of CWLS reporting. Accountability governance is an important foundation in managing waqf funds. BWI, together with the Directorate General of Risk Financing Management (DJPPR), released the CWLS product for the first time in 2020. Then, every year, they release CWLS with the latest series numbers (Table 11). Unfortunately, of the many

Table 10
Rater agreement and significance.

Aspect	W	P-value
Literacy	0.7946	0.0040**
Trust	0.7634	0.0050**
Professionalism	0.4509	0.0941*
Transparency	0.4674	0.0911*
CWLS Competitiveness	0.3929	0.1509
Significance	*	$0.05 < x < 0.1$
	**	$0.001 < x < 0.05$
	***	<0.001
W classification	Weak	<0.4
	Moderate	$0.4 < W < 0.75$
	Strong	$0.75 < W < 0.99$
	Perfect	1.00

Source: Author, Processed Data (2025)

Table 9
CWLS priority problems based on ANP.

ASPECT	AKA	REG	PRACTICE	ASO	Geomean	Rank
Literacy	0.040503	0.063562	0.028962	0.039945	0.044858	3
Trust	0.062242	0.055907	0.04706	0.040400	0.052630	1
Professionalism	0.063035	0.037634	0.038997	0.059601	0.049331	2
Transparency	0.031382	0.037634	0.072672	0.045539	0.044482	4
CWLS Competitiveness	0.022098	0.026661	0.029193	0.031603	0.027556	5

Source: Author, Processed Data (2025)

series launched, the annual CWLS management report was only published in 2021, which was CWLS management in 2020.

In practical terms, CWLS managers can start by establishing a transparent and regularly audited reporting mechanism, publicly disclosing how waqf funds are used and their outcomes. This is in line with Waqf Core Principles and provides an actionable step to build confidence among prospective donors. Regulators such as BWI can issue mandates requiring quarterly disclosures and independent audits. These findings support the critical need for policymakers and CWLS managers to strengthen institutional governance, accountability, and communication strategies to restore and maintain public trust.

The second reason is that CWLS promotion is often limited to banks and Islamic social financial institutions. Even though the majority of Indonesian people still access conventional banks. It is felt that coverage in telecommunications media is not massive yet. As a result, people who do not understand the concept and benefits of CWLS tend to be hesitant to participate.

There are five solutions offered to increase public trust in CWLS management (Table 12). The priority solution that needs to be followed up by all CWLS managers is to increase the standardization of governance and capacity of waqf institutions. This emphasizes the necessity of an all-encompassing outreach plan that uses both traditional and digital channels. Mobile apps, QR code-based donations, AI-powered educational resources, and fintech-integrated waqf platforms are examples of technological solutions that are still underutilized in CWLS promotion but have the potential to be powerful avenues for increasing accessibility and visibility. Stakeholders should address this gap. The growing global digitization of Islamic finance suggests that digital trust-building is equally as important as conventional approaches.

Waqf institutions and the government need to maintain their integrity and good reputation in implementing CWLS. The reputation and perceived integrity of waqf institutions directly impact donors' trust, which subsequently influences their intention to donate. This also includes the recruitment of trusted waqf managers (Nazhir) (74). Based on WCP (38) about the Nazhir qualification, selection criteria for the waqf manager should be established to increase the trust of the waqif and the credibility of the institution.

Indonesian Waqf Board (BWI) is advised to form a special audit team responsible for monitoring the implementation of the CWLS program and Nazhir's performance. This solution is in line with Waqf Core Principle (WCP) point 13 about Good *Nazhir* Governance, which states that the waqf supervisor should provide guidance to waqf institutions on the expectations for sound Nazhir governance. There is a need for a binding policy regarding the routine collection of CWLS performance reports. This can be done if there is a mandate from the authorities, in this case, BWI, to all relevant stakeholders. Based on WCP, the waqf supervisor should regularly assess a waqf institution's *Nazhir* governance policies and practices commensurate with Sharia regulations and systemic importance.

Table 11
CWLS Series and Achievements 2020–2023

Year	Series	Total
2020	SW001 SWR001	Rp. 65,760,000,000
2021	SWR002	Rp. 24,141,000,000
2022	SW002 SW003 SW004 SWR003	Rp. 288,250,000,000
2023	SWR004 SW005 SW006	Rp. 350,000,000,000

Source: BWI, various years

Table 12
Priority solutions to trust problems.

Code	Trust Solutions	GEOMEAN	Rank
SK1	Increase the standardization of governance and capacity of waqf institutions	0.023106	1
SK2	Waqf institutions and the government need to maintain their integrity and good reputation in order to increase public trust	0.018044	2
SK3	BWI mandates all CWLS stakeholders to report performance routinely	0.016073	5
SK4	BWI formed a special audit team to implement the CWLS program, and Nazhir's performance	0.018044	2
SK5	Create and implement a monitoring and evaluation scheme that involves all relevant stakeholders	0.016536	4

Source: Author, Processed Data (2025)

5.2. Literacy

The next priority problem is regarding public literacy in the CWLS program. Many people do not understand the concept of cash waqf, how it works, and its benefits, so the potential for cash waqf that can be developed for productive purposes is not yet optimal (Nofianti et al., 2022; Sukmadilaga et al., 2021). The second highest-ranked problem is low public literacy regarding the CWLS program. Many individuals do not understand the concept of cash waqf, its mechanisms, or the social and financial benefits it offers. From an Institutional Theory perspective, this reflects a failure of institutional support systems—including regulators, educational bodies, and waqf institutions—to embed waqf literacy into formal structures and norms. The absence of waqf-related financial education in national curricula or standardized socialization frameworks indicates a gap in institutional isomorphism. Key actors have not yet aligned around shared expectations for knowledge dissemination (Dimaggio & Powell, 2004).

Simultaneously, Behavioral Finance Theory explains that low literacy can exacerbate irrational decision-making and risk aversion. According to Thaler (2016), individuals with limited financial knowledge are more susceptible to status quo bias and loss aversion, preferring familiar instruments such as zakat or conventional savings over innovative but less understood tools like CWLS. Even if CWLS offers competitive social and financial returns, without sufficient understanding, people are unlikely to engage due to perceived complexity or uncertainty.

This finding is relevant to research from (Akbar & Al Ihsan, 2023), which stated that Waqf literacy significantly influences the interest of potential donors, particularly among Indonesian Muslim millennials. Apart from that, *Nazhir* often does not have adequate knowledge about the CWLS program, which causes the management and utilization of waqf funds to be suboptimal (Yasin, 2021). *Nazhir*, who lacks literacy, tends to be unable to manage and develop waqf funds productively and efficiently.

Based on information from experts, the solution to increasing literacy regarding waqf, cash waqf, and CWLS includes several strategies. First, relevant stakeholders are advised to massively increase the literacy agenda, including contemporary waqf and CWLS, by targeting regions. Second, it is recommended that material about CWLS be added to the educational curriculum in stages. Third, to facilitate access to information and community participation, it is recommended that digital platforms such as the "One Indonesian Waqf" website, social media, and the Mobile Banking application be provided (Berakon et al., 2022b; Qurrata et al., 2020). Fourth, the literacy or socialization activity of CWLS should also be monitored by the waqf supervisor. Based on WCP, the waqf supervisor requires that waqf institutions have adequate socialization and education programs to ensure the public is kept well informed about waqf.

5.3. Professionalism

The next problem, which is no less important, is related to the professionalism aspect of implementing CWLS. Public trust in waqf institutions is low, partly due to the perceived lack of professionalism among *Nazhir* (Ahmad, 2019; HjMohaiyadin & Aman, 2021). The main problems related to the professionalism of CWLS implementers are the limited number of N*azhir*s who have fund manager level competencies, the inability of *Nazhir*s to create programs that attract the interest of *Wakif*s or prospective *Wakif*s, and the lack of synchronization between *Nazhir*s' competencies and the CWLS program.

From the lens of Institutional Theory, professionalism is a reflection of how well waqf institutions have internalized and institutionalized standards, certifications, and accountability mechanisms. A lack of normative pressure to professionalize, such as standardized training or legally mandated certifications, leads to heterogeneous capabilities among Nazhir and erodes confidence in their capacity to manage waqf productively.

Moreover, drawing from Behavioral Finance, public perception of professionalism is also influenced by representativeness bias, where a few underperforming or poorly managed cases shape the overall view of the sector. If potential wakif perceive CWLS managers as lacking professionalism, they are less likely to engage, regardless of the objective competency of other Nazhir. This aligns with research by Ahmad (2019) and Hj.Mohaiyadin and Aman (2021) found that perceptions of professionalism strongly affect donor participation.

Several solutions have been proposed to increase professionalism in waqf management. First, requiring *Nazhir* to obtain certification as an investment manager and project manager and carry out a Social Return on Investment (SROI) analysis will increase their ability to manage waqf funds more effectively and transparently (Nofianti et al., 2022; Yasin, 2021). Furthermore, a collaboration between the BWI and professional investment management institutions can provide Nazhir access to best practices in managing waqf assets (Nour Aldeen et al., 2022). Lastly, considering the use of a fund manager, such as *Nazhir*, can ensure that the management of waqf funds is carried out by individuals who have special expertise in investment, so that the potential results of waqf investments can be significantly optimized.

5.4. Summary of problems and solutions

Table 13 presents a summary of the identified problems in CWLS implementation and their corresponding proposed solutions, as synthesized from the ANP and DEMATEL analysis. This table offers a concise overview of the systemic barriers and strategic actions that CWLS stakeholders can take to address each dimension. While the solutions are further elaborated and prioritized in Appendix A, this summary serves as a practical reference for researchers and practitioners seeking to replicate or adapt the model.

For instance, the lack of public trust, ranked as the most critical problem, can be addressed through institutional strategies such as standardized governance frameworks and mandated audits. These interventions are expected to reinforce the legitimacy of CWLS and align with the Waqf Core Principles (WCP) regarding Nazhir accountability and reporting transparency.

Meanwhile, low public literacy, particularly in non-urban regions, reflects a structural and behavioral gap. Solutions like mass socialization, digital learning tools, and integration into national education curricula aim to institutionalize waqf literacy in both formal and informal settings. These initiatives also counteract behavioral biases such as status quo preference and loss aversion, as identified in our theoretical framework.

The problem of Nazhir professionalism was also prominent. A lack of capacity to design attractive, impactful waqf programs and manage investment flows effectively limits public engagement. Solutions such as requiring investment and project management certifications and promoting partnerships with professional fund managers address both institutional capability and public perception.

Table 13
Summary of CWLS issues and solutions.

Identified Problem	Corresponding Proposed Solution
Lack of public trust in CWLS governance	Standardize governance; strengthen integrity and audit mechanisms
CWLS reporting is not routinely published	Mandate regular reporting; form dedicated audit and evaluation teams
Perception of risk or fund misuse	Maintain institutional reputation; increase transparency of fund use
Lack of public literacy on waqf and CWLS	Mass education campaigns in rural areas; integrate waqf into curricula
Nazir (waqf manager) lacks CWLS knowledge	Increase training, collaborate with universities, and use digital outreach platforms
Nazir lacks professional investment competence	Require certification (investment/project management); SROI analysis
Nazir is unable to design attractive waqf programs	Employ professional fund managers; align programs with Wakif's expectations
Limited CWLS marketing to a broader public	Increase digital marketing; partner with influencers and social media channels
Lack of clear CWLS performance reporting standards	Develop national SOPs for waqf reporting; Ministry of Religion oversight
Weak data transparency for potential wakif	Create transparent dashboards; disclose impact metrics
CWLS competitiveness vs. other financial instruments is low	Reframe CWLS as a blended return vehicle (spiritual + financial); benchmark best practices
Investment periods are too long for donor expectations	Offer flexible or shorter-term CWLS instruments with visible returns

Source: Author

Transparency-related issues, including irregular reporting and limited stakeholder access to information, reduce confidence in CWLS. Solutions here focus on creating uniform reporting standards, public dashboards, and performance visibility, which together enhance trust heuristics and reduce perceived ambiguity in fund management.

Lastly, the issue of CWLS competitiveness underscores a need to reposition CWLS not merely as a financial instrument, but as a blended-value proposition offering both spiritual fulfillment and long-term socio-economic returns. Introducing more flexible investment periods or visible short-term outcomes may attract new donor profiles, particularly younger investors accustomed to transparent and rewarding platforms.

6. Conclusions

This research identifies the factors hindering CWLS sales from reaching targets and falling behind other Sharia investment instruments. With the DEMATEL-ANP approach, researchers succeeded in revealing five aspects of the problems faced: literacy, trust, professionalism, transparency, and CWLS Competitiveness. The main problem is the low level of public trust in the management of CWLS.

Nevertheless, this study remains highly relevant as a policy guideline for CWLS management to increase sales. As a practical implication, there are five aspects developed in this research that could be key points to improve CWLS development. In terms of trust aspects, CWLS management could increase the standardization of governance and capacity of waqf institutions as a top priority, b) waqf institutions and the government need to maintain their integrity and good reputation in implementing CWLS, c) BWI could be advised from a special audit team responsible for monitoring the implementation of the CWLS program and the performance of *Nazhir*, and d) create and implement a monitoring and evaluation scheme that involves all relevant stakeholders.

The findings of this study highlight that trust, literacy, professionalism, transparency, and competitiveness are interrelated factors that significantly affect the success of CWLS. The strategic solutions prioritized, such as standardized governance, certified Nazhir training, digital literacy campaigns, and transparent reporting, are highly relevant not

only for CWLS but potentially for other Islamic financial products with similar characteristics.

For instance, instruments such as Sukuk Social Impact Bonds, Islamic microfinance, and zakat-based investment schemes also rely on public trust, professional management, and transparent reporting to gain legitimacy and participation. Therefore, the barriers and solutions identified in this study may be transferable, especially to products that blend social finance objectives with investment features.

However, generalization must be approached with caution. CWLS operates within a unique institutional and behavioral context shaped by Nazhir governance, wakif preferences, and sharia compliance specific to waqf assets. Islamic finance products that emphasize profit-sharing (e.g., *mudarabah, musharakah*) or market-linked returns may require different strategic emphasis, particularly in areas like risk tolerance, financial return expectations, or investor protection.

6.1. Practical implications

The practical implications of this study highlight actionable strategies for CWLS stakeholders rooted in Institutional and Behavioral Finance Theories. First, improving institutional governance through standardized reporting, independent audits, and Nazhir certification addresses systemic shortcomings that contribute to public distrust. These changes align with coercive and normative mechanisms within institutional theory, promoting legitimacy and operational discipline among waqf managers.

Second, addressing public literacy requires coordinated efforts across institutions. This includes curriculum integration, outreach to underserved regions, and partnerships with universities and religious organizations. Such efforts institutionalize waqf literacy and help close knowledge gaps, particularly for individuals outside urban centers. Additionally, technological solutions—like mobile platforms and waqf dashboards—can lower cognitive barriers, providing behavioral nudges that support informed financial decision-making.

Third, enhancing professionalism by requiring certification and SROI analysis ensures that the waqf is managed by qualified individuals. This responds to institutional pressures while correcting public misperceptions, which behavioral finance suggests are often shaped by anecdotal evidence or negative outliers.

Fourth, transparency must be enhanced through proactive disclosures, clear reporting frameworks, and accessible communication channels. From a behavioral standpoint, transparency reduces ambiguity and fosters trust heuristics, whereby stakeholders judge institutions by the clarity and frequency of information they provide.

Finally, CWLS's competitiveness can be improved by reframing the narrative, emphasizing tangible returns and social impact. Communicating CWLS as a blended value investment (both spiritual and financial) can appeal to a broader audience by aligning with behavioral motivations for meaningful giving and investment.

The DEMATEL-ANP method ensures that these strategies are not just reactive but prioritized based on expert consensus and theoretical grounding. This enables policymakers and managers to act effectively within a structured, empirically supported framework.

6.2. Managerial contribution

The findings reveal that public distrust in CWLS managers is the main issue, followed by concerns about professionalism, literacy, transparency, and CWLS competitiveness. The most critical managerial implication involves strengthening public trust in CWLS management. Managers must focus on establishing robust governance standards, transparency, and accountability mechanisms. This includes regular performance reporting, audits, maintaining institutional integrity, and proactive communication to reassure stakeholders that their contributions are managed effectively and ethically.

Second, professionalism among CWLS managers (Nazhir) requires immediate attention. Managers should prioritize ongoing professional development, including certifications in investment and project management. Such competency-building ensures managers possess the necessary skills to develop appealing waqf programs, efficiently manage funds, and deliver measurable social impacts.

Enhancing public literacy ranks third and is vital to increasing public participation. Managers should intensify efforts to educate the public about CWLS's benefits, operational procedures, and social impacts. Effective strategies include nationwide educational campaigns, incorporation of CWLS content into school and university curricula, and digital platforms that simplify public access to CWLS information and investment opportunities.

Fourth, transparency is crucial to maintaining stakeholder confidence. Managers should implement clear and regular communication strategies that disclose comprehensive information on fund utilization, financial performance, and social impacts. Transparent reporting standards and accessible platforms for stakeholders to review information will enhance confidence and trustworthiness in CWLS operations.

Lastly, improving CWLS's competitiveness requires managers to demonstrate CWLS's unique advantages over other investment instruments clearly. They should communicate the combined financial and social returns of CWLS effectively. Additionally, benchmarking CWLS against global best practices and considering innovative financial models will help attract a broader range of investors. The five aspects developed in this research are key to the development of CWLS.

6.3. Limitation

This research faces some limitations. First, the study relies on a relatively small sample size of 14 experts, which introduces inherent subjectivity into the findings. Although expert opinions provide valuable insights, potential biases stemming from individual experiences or professional affiliations might influence judgments and interpretations. Additionally, despite efforts to include diverse expert groups (academics, practitioners, regulators, and associations), some stakeholder perspectives may still be underrepresented.

Second, the research context is specifically focused on CWLS in Indonesia. Consequently, the findings might not be directly generalizable to other countries or different socio-economic contexts, as institutional structures, regulatory environments, cultural values, and financial literacy levels vary significantly across regions. Although this study provides important insights into the barriers to CWLS implementation in Indonesia, its generalizability to other Muslim-majority countries is inherently limited. This is due not only to Indonesia's unique waqf governance structure and institutional context, but also to cultural, religious, and regulatory differences across countries. For example, nations like Malaysia or Saudi Arabia may have more developed legal frameworks, centralized waqf authorities, or different public perceptions of Islamic finance, all of which can influence the relevance and applicability of the findings. Therefore, caution must be taken when extrapolating the results, and future comparative studies are recommended to examine how CWLS or similar instruments operate under varying national conditions.

Third, technological solutions were not explored in this study. The exclusion of technological considerations in this study was a deliberate methodological choice. This research focused on uncovering institutional, behavioral, and managerial barriers to CWLS implementation, which emerged as the dominant themes from expert consultations during the initial focus group discussions. While digital platforms, mobile applications, and financial technology tools have the potential to enhance CWLS accessibility, literacy, and transparency significantly, these were not prioritized by the expert panel as core challenges compared to governance, trust, professionalism, and public understanding. As a result, they were excluded from the DEMATEL-ANP modeling framework to preserve analytical clarity and focus. Nonetheless, the authors acknowledge that technological innovations represent a

valuable opportunity for future research and practice in optimizing CWLS performance. Given the rapid advancements in financial technology and its growing importance in enhancing financial instruments' effectiveness, excluding technological factors could limit the comprehensiveness and applicability of the proposed recommendations.

Fourth, the dynamic nature of the CWLS landscape means the identified barriers and influencing factors may evolve rapidly, potentially affecting the long-term relevance of the findings. Regular updates and further studies would be necessary to maintain the findings' applicability.

Fifth, the DEMATEL-ANP method aggregates expert opinions, inherently carrying the potential for disagreement among experts. The ANP approach addresses potential biases by systematically structuring the decision-making process, employing pairwise comparisons, and using consistency checks. These consistency checks help minimize individual biases and subjective judgments, ensuring that results more accurately represent collective expert consensus rather than isolated personal opinions. Nevertheless, unresolved differences among experts might still influence the prioritization of criteria and overall conclusions.

Lastly, it is recognized that other factors influencing CWLS performance could exist beyond those included in the study framework. Additional research exploring broader economic, social, political, or regulatory factors could provide more comprehensive insights into optimizing CWLS performance.

6.4. Future research and recommendations

The further research recommendation from this research is that the next article could deepen empirical research on *Nazhir*'s professionalism. It is predicted that research about CWLS management professionalism will have many important influences on other variables on CWLS performance. On the other hand, we suggest the next researcher to: 1) expanding the sample size to include a broader and more diverse group of stakeholders to enhance representativeness and reduce biases in expert judgment; 2) conducting comparative studies in different international contexts to examine the generalizability and applicability of the findings across diverse socio-economic and cultural environments; 3) investigating the impact and potential of technological advancements and digital solutions in optimizing CWLS performance and enhancing stakeholder engagement; 4) conducting longitudinal studies to monitor changes in barriers and success factors of CWLS over time, providing insights into evolving trends and facilitating proactive adjustments in strategies. 5) exploring and integrating additional influencing factors, including broader economic conditions, regulatory changes, political stability, and cultural factors, to create a more comprehensive and multidimensional understanding of CWLS performance determinants.

CRediT authorship contribution statement

Muhamad Nafik Hadi Ryandono: Writing – review & editing, Writing – original draft, Methodology, Funding acquisition, Data curation, Conceptualization. **Tika Widiastuti:** Writing – review & editing, Data curation. **Dian Filianti:** Writing – review & editing, Methodology. **Anidah Robani:** Writing – review & editing, Methodology. **Muhammad Ubaidillah Al Mustofa:** Writing – review & editing, Methodology, Data curation, Conceptualization. **Fitriah Dwi Susilowati:** Writing – review & editing. **Ida Wijayanti:** Writing – review & editing, Methodology, Data curation. **Eka Puspa Dewi:** Writing – review & editing, Methodology, Data curation. **Nikmatul Atiya:** Writing – review & editing, Methodology, Data curation.

Data availability

Data will be made available on request.

Ethical statement

This study was supported by a research grant from the Institute for Research and Community Service (Lembaga Penelitian dan Pengabdian Kepada Masyarakat - LPPM) at Universitas Airlangga through the International Research Collaboration (IRC) grant scheme #500, under contract number 340/UN3.LPPM/PT.01.03/2024. The research was conducted in full compliance with ethical considerations, as approved by the ethics committee of Universitas Airlangga, adhering to the ethical guidelines outlined in the Airlangga Chancellor's Regulation Number 34 of 2019 and the Dean Decree Number 88/UN3.1.4/2020.

Declaration of the use of AI

During the preparation of this work, the author(s) used Google Translate to translate Indonesian scripts into English, Quillbot to paraphrase sentences, and Grammarly to ensure the correctness of the grammar used. After using these tools, the authors reviewed and edited the content as needed and take full responsibility for the content of the published article.

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Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Glossary

ANP	A decision-making method that uses a network of relationships among criteria to determine their relative importance and priority in a decision-making process.
Blended Financing	A financial strategy that combines philanthropic and commercial financing to fund social projects. Blended financing helps reduce risk and increase the total amount of funds available for sustainable projects.
BWI (Indonesia Board of Waqf)	The governmental body responsible for overseeing and managing waqf assets in Indonesia. BWI works to ensure the effective use of waqf for charitable purposes and to enhance the role of waqf in national development.

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CWLS	A Sharia-compliant financial instrument that combines cash waqf (Islamic charitable endowment) with sukuk (Islamic bonds) to fund social welfare projects and investments.
DEMATEL	DEMATEL is a method that analyzes causal relationships between various criteria. DEMATEL will eliminate several criteria that do not have a significant relationship by determining the threshold
ISF (Islamic Social Finance)	A sector of Islamic finance that focuses on social and charitable activities, aimed at supporting community welfare, economic development, and humanitarian efforts in accordance with Islamic principles.
LKS-PWU	A type of institution focused on managing and collecting cash waqf. LKS-PWU facilitates the integration of waqf into the financial system, particularly in the context of Cash Waqf Linked Sukuk (CWLS).
Nazhir	Nazhir is the term for a manager or administrator of Waqf assets. They are responsible for overseeing the management, development, and distribution of Waqf funds or properties.
Sharia	A legal system based on Islamic principles derived from the Quran and Hadith. Sharia law governs various aspects of both private and public life, including financial transactions, contracts, and charitable activities.
Sharia Compliance	The adherence to Islamic laws and principles in financial transactions. In Islamic finance, this ensures that investments, contracts, and products do not involve prohibited activities such as interest (riba) or excessive uncertainty (gharar).
Sukuk	An Islamic financial instrument similar to bonds but structured to comply with Sharia law. Sukuk certificates represent ownership in a tangible asset, usufruct, or investment in a project, and the holder receives returns based on the underlying asset.
Waqf	A form of Islamic endowment where a donor gives a property, asset, or cash to be used for charitable or religious purposes. It is considered a form of philanthropic giving in Islamic finance.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.ssaho.2025.101588.

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