International Journal of Islamic Finance, Vol. 03, No. 02 (2025) 083-109
Published by Department of Islamic Financial Management, Universitas Islam Negeri Sunan Kalijaga Yogyakarta
e-ISSN: 3031-8068
DOI: https://doi.org/10.14421/ijif.v3i2.2801

# Reconstructing Islamic Finance Through Maqashid Shariah and Green Economy: An Agent-Based Adaptive Model

Iman Supriadi[1]; Mochamad Fatchurrohman[2]; Rahma Ulfa Maghfiroh[3]; Rukhul Abadi[4]

[1]STIE Mahardhika Surabaya, email: iman@stiemahardhika.ac.id (Corresponding)
[2]STIE Mahardhika Surabaya, email: mochamad.rohman@stiemahardhika.ac.id
[3]Universitas Islam Negeri Sunan Ampel Surabaya, email: rahma.ulfa@uinsby.ac.id
[4]STEBI Syaikhona Kholil Sidogiri Pasuruan,
email: rukhulabadi@syaikhonakholilsidogiri.ac.id

## Abstract

**Background:** The global financial landscape is evolving toward greater ethical, social, and environmental accountability. However, Islamic finance originally a moral alternative to capitalism often mirrors conventional systems with limited Shariah depth. Bridging the gap between maqāṣid al-sharīʿah ideals and practice requires reconstructing Islamic financial governance through an integrative model aligning Shariah principles with green economy sustainability.

**Objectives:** This study aims to reconstruct an Islamic financial model grounded in maqashid al-shariah and green economy principles through the Agent-Based Modeling (ABM) approach, in order to understand how green fiscal policies such as carbon taxation and green subsidies affect the investment behavior of Islamic financial institutions and the dynamics of economic sustainability.

**Novelty:** This research introduces a novel conceptual framework called the Maqashid Green Adaptive Finance System (MGAFS), which operationalizes maqāṣid al-sharīʿah within the context of adaptive financial governance. Unlike prior studies that are predominantly descriptive or institutional, this study employs ABM to dynamically simulate multi-agent interactions among regulators, IFIs, and consumers in response to green fiscal policies. The model represents a methodological and theoretical innovation by bridging Islamic ethical foundations with computational systems thinking, thereby transforming maqāṣid al-sharīʿah from a normative doctrine into an empirical tool for sustainability analysis.

**Research Methodology / Design**: This study employs an experimental computational approach based on Agent-Based Modeling (ABM) involving three primary agent groups: regulators, Islamic financial institutions (IFI), and consumers. The main parameters include the number of consumers, number of IFI, simulation periods, carbon tax rates, and levels of green subsidies. Two policy scenarios high green subsidy and high carbon tax are compared to analyze the systemic responses to different policy interventions.

**Findings:** The simulation results indicate that green subsidies have a more significant impact on enhancing green investment and total income compared

**Keywords:**
Islamic Finance; Green Economy; Carbon Tax; Green Subsidy; Agent-Based Modeling

**JEL Classifications:**
G20; Q56; C63; O44; Z12

to carbon taxes. However, the combination of both policies produces a synergistic effect on the long-term stability of the Islamic financial system.
**Implication:** These findings provide an empirical foundation for policymakers to integrate the principles of maqashid shariah with green economic instruments, thereby strengthening sustainable and adaptive governance within the Islamic financial system amid the global ecological transition.

Received: November 11, 2025; Revised: November 28, 2025; Accepted: November 30, 2025; Available online: November 30, 2025

## A. Introduction

The recent evolution of the global financial system demonstrates increasingly complex dynamics, marked by rising demands for sustainability, social justice, and ecological responsibility (Sheraz et al., 2021; Chebo et al., 2024; Murtaza et al., 2024). Within this context, Islamic finance emerges as an ethical alternative to the capitalist system, which is predominantly driven by profit and short-term growth orientations (Rahma & Elfaki, 2025; Azmat & Subhan, 2021; Lai, 2021; Hasnat et al., 2025). Nevertheless, in practice, contemporary Islamic financial institutions largely operate within a sharia-compliant framework replicating conventional models with formalistic Sharia modifications rather than establishing a genuinely sharia-based system (Suzuki & Miah, 2020; Shalhoob, 2025; Muhammad et al., 2021; Wisandani et al., 2025). This misalignment between the normative principles of maqāṣid al-sharī'ah and the realities of a capitalist global market generates a fundamental paradox in the developmental trajectory of modern Islamic economics (Ul-Haq et al., 2020; Harahap et al., 2023; Kato, 2022).

Meanwhile, the global shift toward a green economy reinforces the necessity to redefine the paradigm and governance of Islamic finance (Khan et al., 2023; Irfany et al., 2024; Raimi & Bamiro, 2025). Issues such as climate change, environmental degradation, and social inequality demand a new approach that integrates Islamic moral values with ecological sustainability principles (Gulzar et al., 2021; Aboukhousa et al., 2024; Bsoul et al., 2022). At the local level, various initiatives such as Baitul Maal wat Tamwil (BMT), Sharia cooperatives, and zakat institutions have demonstrated the resilience of microeconomic systems grounded in the values of justice and solidarity. However, these initiatives often fail to evolve into globally scalable institutional frameworks due to limitations in governance models, inter-entity coordination, and adaptive incentive mechanisms (Ayub et al., 2023; Al-Jayyousi et al., 2022; Asutay, 2025).

Thus, the reconstruction of Islamic finance has become both a scientific and practical imperative. A new conceptual model is required one that is not only normative but also dynamic and adaptive to systemic transformations. In this context, the Agent-Based Model (ABM) approach gains significance, as it enables the simulation of complex and evolutionary interactions among Islamic economic actors (agents) in responding to global market dynamics and green economy policies (Gao et al., 2023; Lu et al., 2024).

Traditional approaches used in Islamic finance such as qualitative assessments, governance indices, institutional case studies, or econometric correlations are not designed to capture the adaptive, multi-agent, and value-driven nature of maqāṣid al-sharīʿah in real economic interactions. These methods treat maqāṣid as static evaluative criteria rather than dynamic behavioral drivers. In contrast, Agent-Based Modeling (ABM) is uniquely suited to operationalize maqāṣid because it allows each maqāṣid dimension to be encoded directly into agents' decision rules, learning processes, and interaction mechanisms. ABM accommodates heterogeneity, bounded rationality, and evolving preferences, enabling a maqāṣid-oriented system to manifest through emergent outcomes rather than imposed assumptions. By simulating how agents internalize ethical and ecological values over time, ABM transforms maqāṣid from a normative framework into an actionable, algorithmic, and testable mechanism something that traditional descriptive or econometric methods cannot achieve.

The central problem addressed in this study is the misalignment between the normative principles of maqāṣid al-sharīʿah and the current practices of Islamic finance, which remain oriented toward replicating conventional financial systems. This disparity has diminished the transformative potential of Islamic finance in fostering an economic system that is just, inclusive, and sustainable (Hadi & Baihaqi, 2020; Putri et al., 2024). Moreover, the integration of maqāṣid al-sharīʿah values with green economy mechanisms remains largely declarative, lacking implementation within an operational and measurable systemic framework (Mursid et al., 2024; Zain et al., 2024). A further challenge arises at the micro and meso levels: how local Islamic economic communities can transition toward adaptive governance that is compatible with global markets, without compromising the moral and sustainability principles that constitute their core ethos.

The evolution of contemporary Islamic finance has shifted from a Shariah-compliance-based system toward a sustainability-oriented paradigm. Jan et al., (2019) demonstrate that sustainable business practices in Islamic banking exert a positive influence on corporate financial performance, particularly when reinforced by Islamic corporate governance. This finding indicates that Shariah governance functions not merely as a compliance mechanism but also as a driver of financial sustainability. Expanding on this, Boudawara et al., (2023) emphasize that the quality of Shariah governance plays a pivotal role in enhancing Environmental, Social, and Governance (ESG) performance among Islamic banks across countries, despite persistent weaknesses in the environmental dimension. Collectively, these studies illustrate that the successful integration of Islamic finance and sustainability is profoundly shaped by the quality of governance grounded in maqāṣid al-sharīʿah values. However, both analyses remain largely institutional and have yet to address systemic reconstruction

across scales, particularly the transformation from local communities to the global market.

Mergaliyev et al., (2019) introduced the Maqasid al-Shariah Augmented Framework as a novel approach to assessing the ethical, social, and environmental performance of Islamic financial institutions. Their findings reveal that Shariah governance factors, ownership structures, and socio-political contexts are critical determinants of maqasid-based performance. Meanwhile, Julia & Kassim, (2019) assert that Imam Al-Ghazali's Maqasid Shariah framework can be employed to evaluate green banking performance, demonstrating that Islamic banks in Bangladesh outperform their conventional counterparts in preserving the dimensions of faith, intellect, and wealth circulation. These studies illustrate that maqasid orientation functions not merely as a moral indicator but also as a systemic metric for economic and social sustainability. However, the existing literature remains predominantly focused on the banking sector and has yet to explore the macro-level transformation of the Islamic financial ecosystem or its application at the community level.

Jan et al., (2021) formulated the relationship between Islamic banking sustainability indicators and the Sustainable Development Goals (SDGs) using the ECA (Exploration, Categorization, Alignment) method. They demonstrated that Islamic sustainability indicators can be aligned with the global SDG agenda, particularly in social and economic dimensions. Similarly, Harahap et al., (2023) conducted a systematic literature review on the intersection of Islamic law, Islamic finance, and the SDGs, affirming that the principles of Maqasid al-Shariah are congruent with the SDGs' mission to achieve universal human sustainability. These studies represent significant progress in harmonizing Islamic normative objectives with global goals. However, their approaches remain largely descriptive and have yet to produce a dynamic model capable of capturing the complex interactions among actors within a sustainability-oriented Islamic financial system.

Faizi et al., (2024) mapped the landscape of Islamic Green Finance in Indonesia and identified green sukuk, waqf-based investments, and socially responsible investments as the primary pillars for financing environmentally friendly projects. These findings align with Mursid et al., (2024), who assert that the Islamic economic system plays a vital role in realizing sustainable green development while maintaining a balance between moral, financial, and environmental dimensions. Furthermore, Raimi & Bamiro, (2025) expanded this concept within the context of Emerging Muslim Economies, demonstrating that Islamic Sustainable Finance can serve as a catalyst for green entrepreneurship and green economic transformation. Collectively, these studies affirm the relevance of the green economy paradigm within the framework of Islamic finance; however, they have yet to address the dynamic mechanisms and multi-agent interactions that determine the effectiveness of its implementation across various scales of economic communities.

Bashori et al., (2024) highlight the integration of a Maqasid Shariah-based digital economy within pesantren in East Java, demonstrating the capacity of local Islamic institutions to transform toward a sustainable digital economy. Meanwhile, Widiastuti et al., (2022) developed an integrated model of Islamic social finance with four stages (4ER) aimed at enhancing the welfare of impoverished communities. The model underscores the importance of integrating zakat, infāq, ṣadaqah, and waqf to reinforce local economic resilience. Together, these studies indicate a new direction for reconstructing the Islamic financial system one that is participatory, decentralized, and adaptive to digital innovation dimensions that are highly relevant to the development of an Agent-Based Model (ABM) as the analytical approach of this research.

Satyakti, (2023) demonstrated that the implementation of Maqasid al-Shariah can enhance competitiveness and increase financing capacity within Islamic banks, particularly in competitive environments. Raimi et al., (2024) further asserted that Islamic Sustainable Finance contributes to financial risk mitigation while supporting the SDGs through Islamic Green Sukuk and impact investing. These findings reinforce the argument that the maqasid- and sustainability-based approach is not only ethically grounded but also economically efficient, with the potential to strengthen the resilience of the Islamic financial system.

Hasnat et al., (2025) present a critique of the modern capitalist system and propose an Islamic value-based alternative through Shariah finance, emphasizing social justice, ethical governance, and environmental sustainability. This study underscores the necessity of a behavioural and ideological shift as a prerequisite for achieving a just green economy aligning with the spirit of the present research, which advocates a reconstructive model through a systemic, ABM-based approach.

Based on the review of previous studies, several key conclusions can be drawn. First, the majority of research remains focused on formal financial institutions particularly Islamic banks while overlooking local community ecosystems as fundamental economic actors. Second, most methodological approaches employed are either conventional statistical analyses or descriptive literature reviews, with limited application of agent-based systemic simulations (ABM) capable of representing the adaptive and complex interactions among Islamic economic actors. Finally, there is a notable absence of studies that comprehensively integrate the Maqasid al-Shariah framework with the Green Economy paradigm in the context of transforming Islamic financial governance from local to global scales.

Unlike previous studies that primarily adopt descriptive, conceptual, or institutional perspectives on maqāṣid al-sharīʿah, the MGAFS framework extends the literature by introducing a dynamic, computationally driven system capable of simulating how maqāṣid values shape real-time financial behavior. Prior works typically assess maqāṣid compliance through qualitative indicators, governance assessments, or institutional-level scoring systems, which do not capture adaptive interactions or emergent system-level outcomes. In contrast, MGAFS operationalizes maqāṣid through algorithmic decision rules embedded in heterogeneous agents regulators, Islamic financial institutions, consumers, and green projects allowing each maqāṣid dimension to be expressed as measurable behavioral parameters. This computational operationalization enables MGAFS to function not only as a normative framework but also as an experimental system for testing policy scenarios, a capability

absent in institutional or descriptive approaches in the existing Islamic finance literature.

This study proposes a reconstruction of the Islamic financial system based on Maqasid al-Shariah and the green economy through the application of an Agent-Based Model (ABM). The ABM approach enables the depiction of the economic system as a network of interactions among diverse agents individuals, institutions, regulators, and global markets operating under a set of Shariah rules and green incentives. Through this modelling, it becomes possible to analyze how localized changes in behavior or policy can generate emergent systemic phenomena, such as financial stability, welfare distribution, or environmental sustainability. Thus, this research offers not only a theoretical solution but also an experimental tool to dynamically and empirically test various Shariah green policy scenarios.

The primary motivation of this study arises from the concern over the lagging progress of Islamic finance in confronting the challenges of globalization, digitalization, and the green transition. Despite its strong value foundations, the Islamic financial system has yet to demonstrate adaptive capacity to transform into a global moral-economic force. Furthermore, there is an academic need to expand the theoretical horizon of Islamic finance from a static paradigm toward an evolutionary–dynamic paradigm, in which maqāṣid al-sharīʿah are positioned not merely as moral norms but as adaptive mechanisms guiding economic interactions toward socio-ecological equilibrium. The ABM approach provides a platform for empirical simulation of maqāṣid principles within complex economic realities, making it highly relevant for constructing a more grounded and applicable theoretical framework.

This study seeks to address several fundamental questions concerning the reconstruction of the Islamic financial system within the context of the global green economy. The primary focus lies in examining how maqāṣid al-sharīʿah principles can be reconstituted to shape an Islamic financial system that is adaptive to the evolving dynamics of the global green economy. Additionally, the research explores how interactions among various Islamic economic agents including local communities, financial institutions, regulators, and global markets can generate emergent patterns that reflect a balance between Shariah values and sustainability principles. To capture the complexity of these interrelationships, the Agent-Based Model approach is employed to simulate the transformational process of Islamic financial governance from the local community level toward broader integration into global markets. Ultimately, this study also aims to assess the extent to which the Maqashid Green Adaptive Finance System (MGAFS) can reinforce the equilibrium between economic sustainability, social justice, and environmental preservation within a holistic and future-oriented framework for Islamic financial development.

The primary objective of this study is to develop and validate a novel conceptual framework termed the Maqashid Green Adaptive Finance System (MGAFS), an adaptive-normative Islamic financial system that integrates maqashid sharia principles into green economy mechanisms through an agent-based simulation approach. This research seeks to reconstruct the concept of maqashid sharia within the context of the green economy and adaptive financial governance in response to global economic changes.

Furthermore, the study develops an Agent-Based Model (ABM) capable of representing the behaviours and interactions among Islamic economic agents, including local communities, financial institutions, and regulators. Through this approach, it aims to analyse emergent behaviours and adaptive dynamics arising during the transformation of the Islamic financial system from the local level toward global integration.

Additionally, this study aspires to formulate evidence-based policy recommendations to strengthen Islamic financial governance, making it more sustainable, inclusive, and aligned with the principles of social justice and environmental stewardship. This study holds substantial theoretical and practical significance. Theoretically, it expands the horizon of Islamic finance by introducing an evolutionary-dynamic approach grounded in complex adaptive systems, thereby shifting the paradigm of Islamic finance from a normative-static orientation toward an empirical-dynamic framework. The Maqashid Green Adaptive Finance System (MGAFS) emerges as a novel contribution to the literature, offering a hybrid framework that bridges spiritual ethics and sustainability science.

Practically, this model provides a simulation-based policy analysis tool that can be utilized by regulators, financial institutions, and local communities to assess policy impacts, design incentive mechanisms, and identify optimal conditions for the transformation of Islamic finance toward the global green economy. The strength of this research lies in its interdisciplinary approach, integrating maqashid sharia theory, green economics, and agent-based modeling, thus yielding both conceptual and methodological contributions with the potential to establish a new foundation for the development of an Islamic financial system that is sustainable, inclusive, and adaptive to the changing times.

## B. Literature Review

### Theoretical Framework

*Paradigm of Islamic Finance Reconstruction*

The increasing complexity of the global financial system necessitates a paradigmatic repositioning of Islamic finance not merely as a framework of formal Shariah compliance but as one that also integrates sustainability and social justice dimensions (Sheraz et al., 2021; Rahma & Elfaki, 2025). In practice, many Islamic financial institutions continue to replicate conventional capitalist models, merely adapting their legalistic aspects to fit Shariah requirements (Suzuki & Miah, 2020; Muhammad et al., 2021). This condition creates a paradox between the objectives of maqāṣid al-sharīʿah and the profit-oriented nature of the global market economy (Ul-Haq et al., 2020; Harahap et al., 2023).

According to Asutay, (2025), a transition toward an "Islamic Moral Economy" is essential to restore substantive morality within Islamic financial practices. This approach emphasizes that maqāṣid al-sharīʿah should not be perceived merely as spiritual norms but as ethical instruments capable of guiding economic behavior toward equilibrium between profitability and sustainability. Consequently, reconstructing the Islamic financial system requires a model that is not only normative but also adaptive to systemic changes occurring at both global and local levels.

*Integration of Maqashid Shariah and the Green Economy*

The global transition toward a green economy has amplified the need to reconstruct Islamic financial governance in alignment with ecological sustainability principles. Khan et al., (2023) and Irfany et al., (2024) affirm that environmentally conscious Islamic banking practices significantly enhance both institutional reputation and financial stability. Similarly, Bsoul et al., (2022) emphasize that environmental ethics in Islam regard environmental preservation as a spiritual trust consistent with the values of maqāṣid al-sharīʿah.

Moreover, Mursid et al., (2024) highlight the pivotal role of Islamic economics in realizing sustainable green development by balancing moral, financial, and environmental dimensions. Faizi et al., (2024) expand this perspective through a mapping of Islamic green finance in Indonesia, underscoring the roles of green sukuk, waqf-based investment, and socially responsible investment as the core pillars of environmentally friendly financing. Therefore, the integration of maqashid shariah and green economy principles demands a systemic approach capable of representing complex interactions among financial institutions, society, and regulators.

*Shariah Governance Quality and Sustainability Performance*

The sustainability performance of Islamic financial institutions is determined by the quality of their Shariah governance. Jan et al., (2019) demonstrate that sustainable business practices in Islamic banking improve corporate financial performance when supported by effective Shariah governance structures. This finding is reinforced by Boudawara et al., (2023), who report that high Shariah-governance quality positively affects Environmental, Social, and Governance (ESG) outcomes, although environmental performance remains relatively weak.

Furthermore, Mergaliyev et al., (2019) develop the Maqasid al-Shariah Augmented Framework, which evaluates the ethical and social performance of Islamic financial institutions. Their results confirm that ownership structure and socio-political context are crucial determinants of maqashid-based performance. Hence, achieving genuine sustainability requires combining strong Shariah governance with adaptive incentive mechanisms that encourage green investment behavior across all levels of economic actors.

*Convergence of Maqashid Objectives and Sustainable Development Goals (SDGs)*

Efforts to align maqashid shariah objectives with the Sustainable Development Goals (SDGs) have been extensively explored by Jan et al., (2021), who introduced the Exploration, Categorization, Alignment (ECA) method to map Islamic banking sustainability indicators against the SDGs. Harahap et al., (2023) reinforce this alignment by asserting that maqashid shariah is congruent with global aspirations for universal human sustainability. Nevertheless, these descriptive approaches have yet to capture the dynamic interactions among actors within a sustainability oriented Islamic financial system.

In this regard, simulation-based approaches such as Agent-Based Modeling (ABM) are vital, as they can capture adaptive behaviors and emergent phenomena arising from the interactions among financial institutions, consumers, and regulators (Douven, 2024; S. Yu, 2023; Lu et al., 2024).

*Local Community-Based Islamic Economic Transformation*

Several studies highlight that local-level Islamic economic initiatives such as Baitul Maal wat Tamwil (BMT) and zakat institutions play a crucial role in enhancing community economic resilience. Bashori et al., (2024) reveal that integrating maqashid-based digital economic models within Islamic boarding schools (pesantren) can foster sustainable local transformation. Meanwhile, Widiastuti et al., (2022) propose an integrated Islamic Social Finance model with four stages (4ER): Rescue, Recovery, Reinforcement, and Resilience, proven effective in improving the welfare of low-income communities.

However, as Ayub et al., (2023) and Al-Jayyousi et al., (2022) explain, the major obstacles to strengthening community-based economies lie in governance models and inter-entity coordination limitations. Therefore, this study proposes an Agent-Based Governance approach that facilitates collective learning and dynamic policy adaptation between local communities and global markets.

*Agent-Based Model (ABM) Approach in Islamic Finance Reconstruction*

The Agent-Based Model provides a robust methodological foundation for understanding complex interactions among Islamic economic actors. J. Yu & Bagheri, (2020) and Lu et al., (2024) demonstrate that ABM effectively represents heterogeneous behaviors and adaptive system dynamics that emerge spontaneously. Within Islamic finance, this model enables empirical analysis of how green fiscal policies such as carbon taxation and green subsidies affect the investment behavior of Islamic financial institutions and income distribution among communities.

This approach aligns with Hasnat et al., (2025), who advocate behavioral and value-based transformations in Islamic economics to address inequalities inherent in modern capitalism. Hence, ABM serves not only as a technical simulation tool but also as an ideological laboratory that integrates maqashid shariah with global sustainability values.

*The Maqashid Green Adaptive Finance System (MGAFS) Model*

As a synthesis of prior scholarship, this study introduces the Maqashid Green Adaptive Finance System (MGAFS), which integrates maqashid shariah principles with green-economy mechanisms through ABM simulation. The model illustrates how fiscal-policy adjustments, social behavior, and financial-institution decisions collectively generate systemic equilibrium among economic efficiency, social justice, and environmental preservation (Raimi & Bamiro, 2025; Satyakti, 2023).

The MGAFS contributes to the theoretical advancement of Islamic finance by extending the scope of maqashid into an evolutionary and dynamic framework, where ḥifẓ al-bi'ah (environmental protection) is recognized as a contemporary maqashid. Through this framework, Islamic finance is repositioned as a transformative engine for equitable and inclusive green development at the global level.

## C. Research Methodology

This study employs a quantitative approach grounded in computational simulation using the Agent-Based Modeling (ABM) method. This approach is selected for its capability to represent heterogeneous behaviors (Douven, 2024; S. Yu, 2023; J. Yu & Bagheri, 2020), dynamic interactions, and emergent effects among agents within a sustainability-oriented Islamic financial system. Through ABM, the research examines how green fiscal policies specifically carbon taxes and green subsidies systemically influence investment decisions, income distribution, and the accumulation of green investments within the Islamic financial ecosystem.

This study employs two primary scenarios to compare the effectiveness of regulatory policies in fostering a balance between economic growth and environmental sustainability. The first scenario, Scenario A, represents a policy configuration characterized by high green subsidies and low carbon taxes, with the carbon tax set at 0.01 and the green subsidy at 0.10. Conversely, the second scenario, Scenario B, illustrates the opposite policy setting, featuring a high carbon tax and low green subsidy, operationalized through a carbon tax of 0.10 and a green subsidy of 0.01. These two scenarios are designed to assess the extent to which different policy combinations influence the green investment behavior of Islamic Financial Institutions (IFI) and the resulting macro-level impacts over the course of the simulation period. The ABM framework is composed of several interacting entities (agents), engaged in iterative processes as depicted in Table 1 below.

**Table 1. Entities (Agents) Involved in the ABM Simulation**

| Agent | Interaction |
|---|---|
| Regulator | Acting as a policy maker with two main instruments:<br>a. Carbon tax (τ): the amount of tax imposed on non-green investments; the higher τ is, the greater the pressure on environmentally unfriendly projects.<br>b. Green subsidy (σ): fiscal incentives for environmentally friendly projects; the greater σ, the stronger the incentive for green investment. |
| Islamic Financial Institution (IFI) | Intermediary agencies that decide their investment portfolios between green and non-green projects based on expected net profits and applicable regulations. |
| Consumer | Individual agents or community groups that influence demand for green products and services, which in turn affects the return on green investment. |
| Green Project | Investment entities that generate returns (Rt) with values influenced by a combination of fiscal incentives and market preferences for sustainability. |

To ensure that the MGAFS model operationalizes maqāṣid al-sharīʿah in a measurable and simulation-ready manner, each maqāṣid dimension is translated into explicit behavioral variables and numerical parameters embedded in the agents' utility structures and decision rules. Ḥifẓ al-dīn is represented as a Sharia Compliance Preference Weight (SCW) that influences consumer and IFI choices toward ethically aligned financial products. Ḥifẓ al-nafs is captured through an Environmental and Social Risk Aversion Parameter (ERAP) that penalizes investments with harmful ecological or social externalities. Ḥifẓ al-ʻaql is modeled through an Information Uptake and Learning Rate (ILR) that determines how agents update beliefs in response to policy changes. Ḥifẓ al-māl is translated into a Wealth Preservation and Profit Sensitivity Coefficient (WPC) embedded in IFI investment evaluations. Ḥifẓ al-nasl is encoded as a Future Welfare Sensitivity Index (FWSI) influencing long-term investment horizons. Finally, Ḥifẓ al-bīʾah is implemented through a Green Impact Score (GIS) that adjusts expected returns based on environmental performance. Together, these parameters transform maqāṣid from normative principles into quantifiable drivers of agent behavior, enabling the MGAFS simulation to generate emergent outcomes that reflect the ethical structure of Islamic finance.

**Table 2. Operationalization of Maqāṣid Principles in MGAFS**

| Maqāṣid Dimension | Model Variable / Parameter | Role in Simulation |
|---|---|---|
| Ḥifẓ al-Dīn | Sharia Compliance Preference Weight (SCW) | Directs agent preferences toward ethical/Sharia-compliant products. |
| Ḥifẓ al-Nafs | Environmental & Social Risk Aversion (ERAP) | Penalizes harmful investment choices. |
| Ḥifẓ al-ʻAql | Information Uptake & Learning Rate (ILR) | Modulates belief updating and adaptive learning. |
| Ḥifẓ al-Māl | Wealth Preservation Coefficient (WPC) | Influences profit-oriented decisions. |
| Ḥifẓ al-Nasl | Future Welfare Sensitivity Index (FWSI) | Extends decision horizon toward intergenerational impacts. |
| Ḥifẓ al-Bīʼah | Green Impact Score (GIS) | Modifies expected returns based on environmental performance. |

The important parameters in the simulation are described in Table 3 below.

**Table 3. Important Parameters in ABM Simulation**

| Variables | Definition |
|---|---|
| Number of Consumers | The large number of consumer agents interacting within the system |
| Number of IFI | The large number of Islamic financial institutions acting as investor agents |
| Number of Iterations | Number of simulation time periods |
| Carbon Tax | Tax rates on non-green investments; the higher the rate, the more it discourages unsustainable activities. |
| Green Subsidy | Fiscal incentives for green investment; the higher the incentive, the greater the environmentally friendly investment. |
| Green Project Return | The rate of return on green projects is influenced by market conditions and regulatory policies. |
| Initial Capital for IFI | The amount of initial capital that determines the initial investment capacity of each IFI. |
| Investment Sensitivity | A behavioural coefficient that indicates the level of responsiveness of agents to policy changes. |

Each IFI agent makes green investment decisions based on the following adaptive utility function:

$$I_t = I_t + \alpha(R_t - \tau) + \beta(\sigma) \quad (1)$$

The total change in aggregate income in the system is defined as the following function:

$$Y_t = \sum_{i=1}^{n}\left(R_t \; x \; I_t^i\right) - \left(\tau \; x \; I_{non\ green}\right) + \left(\sigma \; x \; I_{green}\right) \quad (2)$$

The MGAFS model is built using a multi-agent framework comprising Islamic Financial Institutions, consumers, and green project developers, each equipped with heterogeneous attributes such as capital endowment, risk attitude, Sharia-compliance preference, learning rate, and environmental sensitivity. Their behaviors are governed by utility-based decision rules that allocate portfolios, select products, or respond to subsidies based on maqāṣid-adjusted incentives. Interactions emerge through market exchanges, regulatory broadcasts, and adaptive belief updates, allowing system-level patterns to arise from micro-level ethical and economic decisions. To operationalize maqāṣid al-sharīʿah, each dimension is converted into measurable parameters including the Sharia Compliance Preference Weight, Environmental and Social Risk Aversion Parameter, Information Uptake and Learning Rate, Wealth Preservation Coefficient, Future Welfare Sensitivity Index, and Green Impact Score which are embedded directly into agents' utility functions and decision mechanisms.

The simulation scenarios are designed to reflect realistic green fiscal instruments, with carbon tax and subsidy levels aligned to international policy benchmarks and renewable energy incentive structures. Parameter choices are informed by empirical literature, Islamic finance theoretical frameworks, and prior ABM studies to ensure credible behavioral representation. Model reliability is reinforced through internal validation of agent behavior, sensitivity analysis across key fiscal and behavioral parameters, and consistency checks against established findings in sustainable finance. These steps ensure that the simulation produces stable, realistic, and theoretically coherent outcomes, strengthening the methodological rigor of the MGAFS framework.

The simulation mechanism in this study is executed using the Python programming language through a structured sequence of stages to ensure the replication of dynamics within a maqashid- and green economy–based Islamic financial system. The process begins with the specification of initial parameters, including the number of agents, initial capital, carbon tax rates, and green subsidy levels. Once these parameters are established, the initial investment allocations of each Islamic financial institution (IFI) and the initial demand from consumers are initialized.

In the subsequent stage, the regulator implements tax and subsidy policies that vary according to the predefined scenarios. The IFI agents then update their investment decisions at each iteration based on behavioral rules embedded within the model. Throughout the simulation process, the system automatically computes total income, green investment accumulation, and capital distribution across each time period. This entire sequence is repeated for a designated number of iterations until the model reaches a stable condition (steady state), thereby enabling the simulation results to reflect the dynamic equilibrium of an adaptive financial system grounded in maqashid principles and the green economy.

The results were analyzed through a scenario-based approach, wherein the average outcomes of Scenario A and Scenario B were compared by calculating the differences in mean green investment and total income. This comparison aims to assess the effectiveness of regulatory policies on system performance indicators, represented by the following function.

$$\Delta I = \bar{I}_B - \bar{I}_A,\ \Delta Y = \bar{Y}_B - \bar{Y}_A \quad (3)$$

Next is the Sensitivity Analysis / Policy Impact Regression, wherein a linear regression model is employed to measure the magnitude of the effects of carbon tax and green subsidies. The model is formulated as follows.

$$Green\ Investment_i = \beta_0 + \beta_1 Carbon\ tax_i + \beta_2 Green\ subsidy_i + \epsilon_i \quad (4)$$

The coefficients β1 and β2 indicate the direction and magnitude of the policy's impact on green investment.

## D. Result & Discussion

### D.1. Result

This study employs an Agent-Based Modeling (ABM) approach to represent the interactions among three key actors within the Islamic financial system grounded in maqashid al-shariah and the green economy paradigm: consumers, Islamic financial institutions (IFI), and regulators. Each IFI produces financial products characterized by varying levels of sharia compliance and environmental impact scores. Consumers make purchasing decisions based on two primary preferences: religious preference (sharia preference) and ecological awareness (green preference). Regulators play a crucial role in maintaining system balance through two main policy instruments a carbon tax (0.01) as a disincentive policy and a green subsidy (0.05) as an incentive policy. The model is designed to simulate the dynamics of adaptive Islamic financial governance, evolving from a local community scale toward global integration.

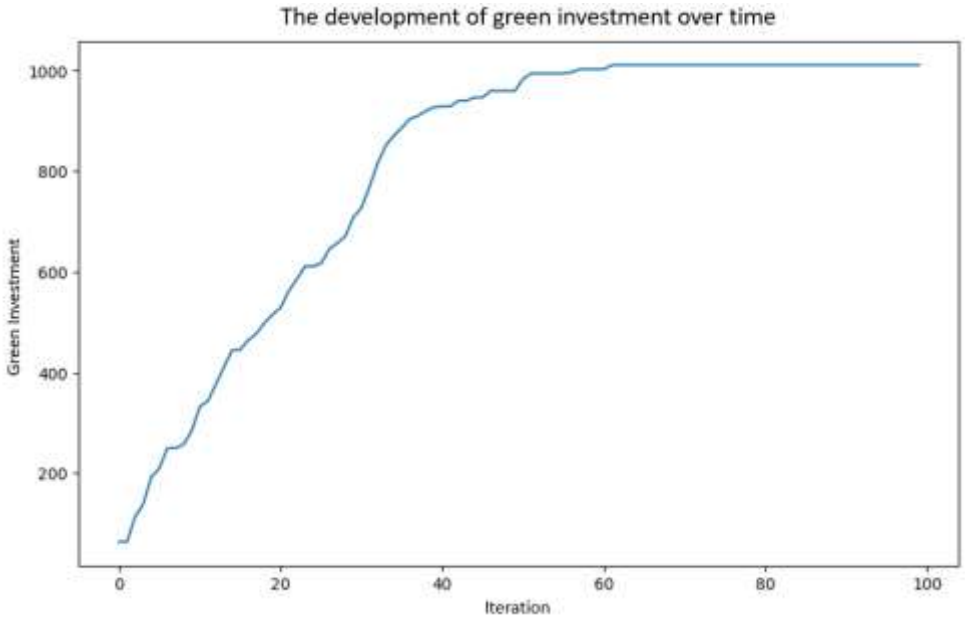
The simulation results reveal a consistent and significant pattern of green investment growth throughout the simulation iterations. As illustrated in Figure 1, the green investment curve exhibits a rapid increase during the initial phase (iterations 0–30), followed by a consolidation phase (30–50), and eventually reaches a stable equilibrium (steady state) beyond iteration 50, with values approaching 1,000. This pattern reflects a gradual adaptation process in which Islamic financial institutions collectively adjust their portfolios in response to green incentives and maqashid al-shariah values. These phases can be classified as presented in Table 4 below:

**Table 4. Dynamic Phases of Islamic Financial System Adaptation within the Maqashid Green Adaptive Finance System (MGAFS) Framework**

| Phase | Iteration Range | Scientific Description |
|---|---|---|
| Phase I – Adaptation Initiation | 0–20 | In this initial phase, the system exhibited a rapid response to the implementation of green policies. Economic agents began to internalize the core values of maqashid al-shariah, particularly hifz al-mal (protection of wealth) and hifz al-din (protection of faith). This stage represents the early adaptation of financial behavior toward the principles of sustainability and sharia-based ethical conduct. |
| Phase II – Dynamic Consolidation | 20–50 | This phase is characterized by a process of collective learning among economic agents, in which interactions and information exchanges foster the diffusion of ethical and ecological behaviors. Investment decision patterns begin to shift toward green-oriented efficiency, while coordination among Islamic economic actors increases significantly. |
| Phase III – Systemic Balance | >50 | At this stage, the system reaches a maqashid–green equilibrium, representing a balance between economic efficiency, social justice, and environmental sustainability. The system's dynamics become stable, reflecting the attainment of a harmonious integration between maqashid al-shariah values and green economy principles within the governance of Islamic finance. |

*Source: ABM output (2025)*

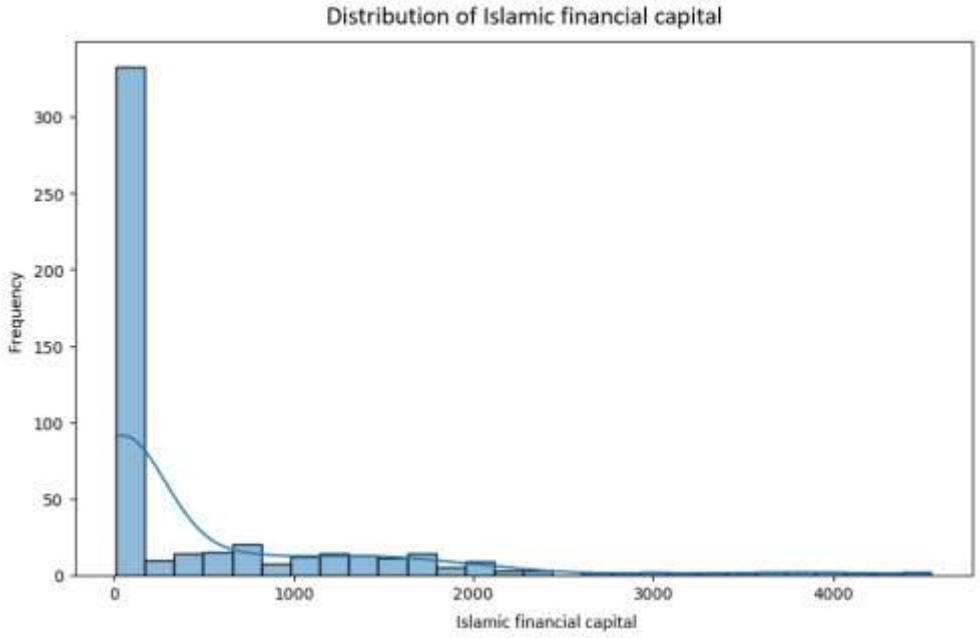
These findings address the research question asserting that the principles of maqashid al-shariah can be adaptively reconstructed within a financial system that is responsive to the mechanisms of the green economy.




*Source: ABM output (2025)*

**Figure 1. Development of Green Investment Over Time**

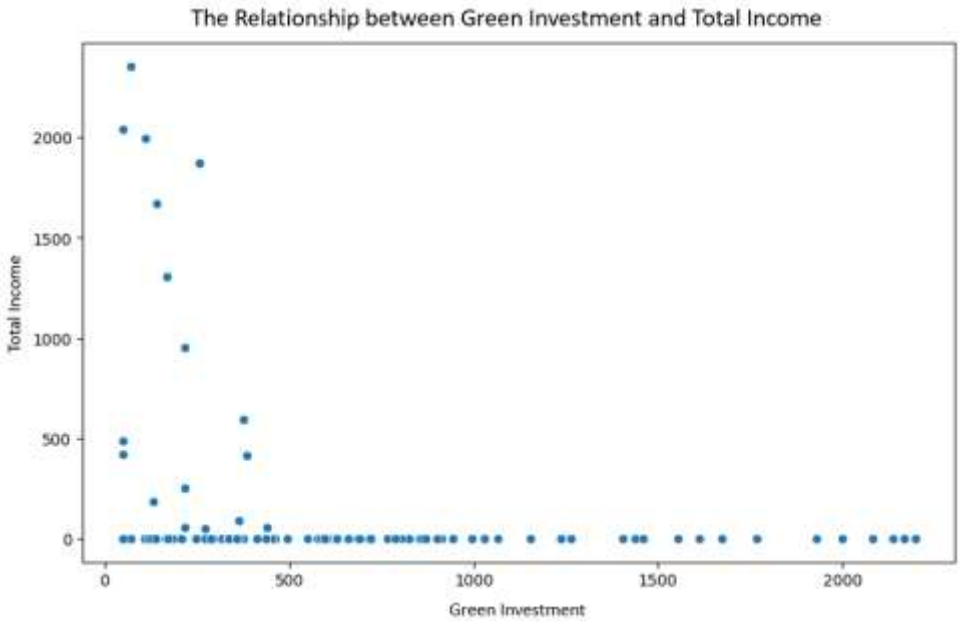
The capital distribution of Islamic financial institutions (IFI) is illustrated in Figure 2, exhibiting a right-skewed pattern. Most IFIs possess relatively low levels of capital, while only a few hold substantially large amounts. This pattern resembles a Pareto distribution, which is commonly observed in agent-based complex economic systems. Such a condition indicates that the dynamics of agent interactions generate inequality in capital accumulation, whereby IFIs with high adaptive capacity and strong managerial efficiency are able to accumulate capital rapidly. Conversely, IFIs with limited access to green investments experience capital stagnation and lag behind in competition. This distribution underscores the heterogeneity of behavior and adaptive capacity among agents within the Islamic financial ecosystem, thereby addressing the second research question concerning emergent behavior patterns in a financial system grounded in maqashid al-shariah and the green economy.




*Source: ABM output (2025)*

**Figure 2. Distribution of IFI Capital**

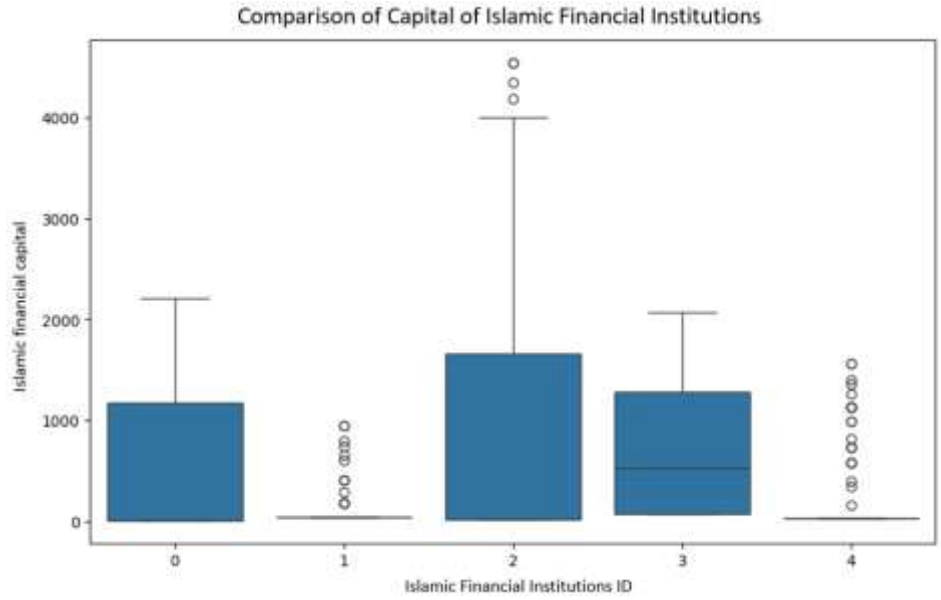
As illustrated in Figure 3, the relationship between green investment and the total income of Islamic financial institutions (IFI) is nonlinear and asymmetric. Most agents are positioned in the low-investment and low-income range, while only a few exhibit high income with varying levels of green investment. These findings indicate that green investments have not yet generated short-term income gains for the majority of agents. This suggests the presence of a lag effect in the impact of green investment on profitability. Consequently, the maqashid green orientation in Islamic finance emphasizes not only immediate profitability but also the creation of long-term sustainable value.




*Source: ABM output (2025)*

**Figure 3. Relationship between Green Investment and Total Income**

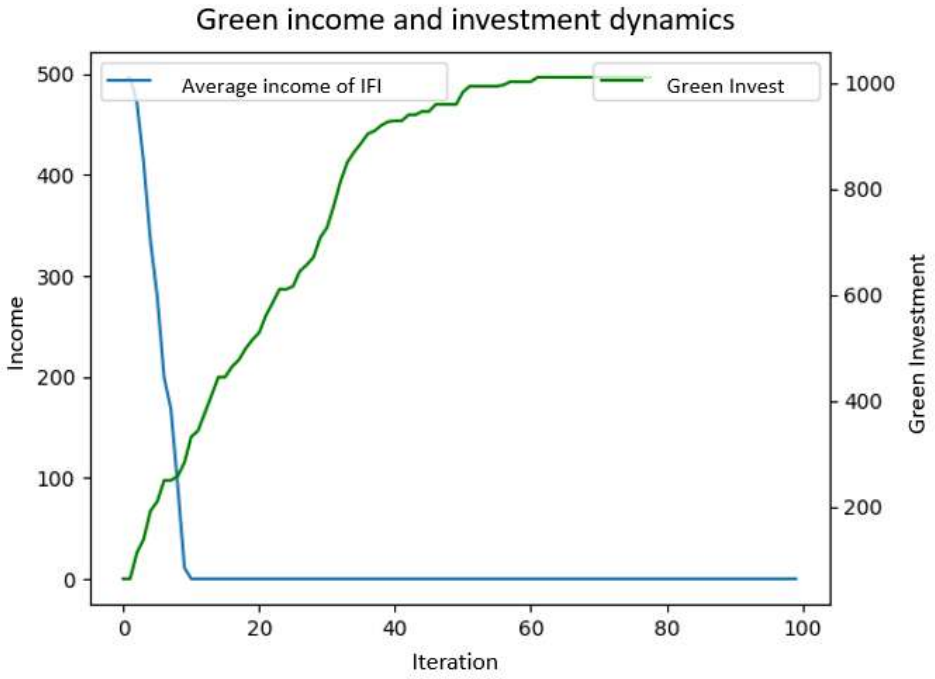
The distribution of capital among Islamic financial institutions (IFI, IDs 0–4) is visualized in Figure 4. IFI ID 2 exhibits the highest median and capital dispersion, accompanied by numerous outliers above the value of 4,000, indicating successful adaptation and an aggressive green investment strategy. In contrast, IFI IDs 1 and 4 display relatively small and stable capital levels, suggesting limited financial capacity and a slow response to green policy implementation. This disparity reflects a system that has not yet achieved collective equilibrium, where path dependency and positive feedback loops reinforce the dominance of highly capitalized agents. These results reinforce the findings presented in Figure 2 and demonstrate that the transformation process toward a maqashid green financial system is still progressing gradually.




*Source: ABM output (2025)*

**Figure 4. Comparison of IFI Capital**

Figure 5 illustrates the dynamics of average income among Islamic financial institutions (IFI) and total green investment under the carbon tax policy. During the initial phase of the simulation (iterations 0–15), the income of financial institutions experienced a sharp decline, while green investment increased significantly, reaching a stable condition after iteration 60. This phenomenon reflects a short-term trade-off between profitability and sustainability. The carbon tax imposed financial pressure on conventional portfolios but adaptively encouraged a capital shift toward environmentally friendly investments. In the long run, the system reaches a new steady state characterized by a balance between sustainable income and green portfolios. These findings directly address the third research question regarding the role of Agent-Based Modeling (ABM) in simulating the adaptive transformation of Islamic financial governance under environmental policy pressures.




*Source: ABM output (2025)*

**Figure 5. Dynamics of Green Income and Investment**

To evaluate the effectiveness of the policy instruments, two comparative scenarios were conducted, as presented in Table 5 below.

**Table 5. Scenario Analysis 2 Comparing Two Regulatory Policies**

| Scenario | Carbon Tax | Green Subsidy | Total Income | Green Investment |
|---|---|---|---|---|
| A | 1% | 10% | 28.70 | 581.09 |
| B | 10% | 1% | 29.84 | 1101.06 |

*Source: ABM output (2025)*

The simulation results indicate that a high carbon tax (Scenario B) generates nearly twice the level of green investment compared to a high green subsidy (Scenario A). Although this policy initially suppresses profitability, the system gradually adapts and ultimately produces a slightly higher total income. These findings suggest that disincentive mechanisms targeting emissions (through carbon taxation) are more effective in fostering long-term restructuring toward a green adaptive financial system than short-term incentive-based policies such as subsidies.

The MGAFS framework provides regulators with a practical, simulation-based policy laboratory for testing green fiscal instruments before implementation. Through its agent-based structure, MGAFS allows policymakers to evaluate how different combinations of carbon taxes, green subsidies, and regulatory incentives propagate through Islamic financial institutions, consumers, and project developers. By capturing adaptive behavior, heterogeneous preferences, and system-wide feedback loops, MGAFS enables regulators to anticipate unintended consequences, identify threshold effects, and assess long-term welfare and environmental outcomes. This makes MGAFS not only a theoretical contribution but also a functional decision-support tool that can guide evidence-based policy design, particularly for aligning Islamic finance regulations with national sustainability agendas and global climate commitments.

The regression analysis of policy sensitivity on green investment is presented in Table 6 and the subsequent table. The estimation results using the Ordinary Least Squares (OLS) model indicate that both policy instruments have a positive and statistically significant effect on green investment.

**Table 6. Regression Analysis of Policy Impact**

| Variables | Coefficient | t-Statistic | P-Value |
|---|---|---|---|
| A | 1% | 10% | 28.70 |
| B | 10% | 1% | 29.84 |

*Source: ABM output (2025)*

The coefficient values indicate that the green subsidy exerts a relatively greater nominal impact on increasing green investment compared to the carbon tax. However, when interpreted alongside the simulation results, the carbon tax demonstrates a more stable and sustainable long-term effect, whereas the green subsidy functions as a short-term accelerator. Accordingly, these findings reaffirm the dual effectiveness of both policy instruments: the green subsidy facilitates the initial transition, while the carbon tax ensures the long-term systemic consistency of the transformation toward a maqashid green equilibrium.

## D.2. Discussion

*Integration of Maqashid Syariah and Green Economy in Islamic Financial Reconstruction*

The findings indicate that the reconstruction of Islamic finance based on Maqashid al-Shariah and the Green Economy requires a paradigmatic repositioning of Islamic finance from a normative Shariah compliance approach toward an adaptive and ecological maqashidic sustainability framework. Within this framework, the objectives of Islamic law are not limited to the protection of spiritual and moral values (ḥifẓ al-dīn, ḥifẓ al-māl, ḥifẓ al-'aql, ḥifẓ al-nafs, and ḥifẓ al-nasl), but are also expanded to include ḥifẓ al-bi'ah (environmental protection) as a contemporary maqashid.

The model developed through the Agent-Based Model (ABM) demonstrates that interactions among economic actors—Islamic financial institutions, society, regulators, and investors—generate adaptive behavioral dynamics that can foster a balance between economic, social, and environmental objectives. These findings reinforce those of Jan et al., (2019), who asserted that sustainable business practices enhance the financial performance of Islamic financial institutions when combined with Shariah-based governance. However, this study advances the discourse further by revealing that the integration of environmental values into the maqashid framework constitutes a structural prerequisite for ensuring the long-term sustainability of the Islamic financial system in the era of green transition.

Furthermore, this study reinforces the findings of Boudawara et al., (2023) regarding the critical role of Shariah governance quality in enhancing ESG (Environmental, Social, and Governance) performance. However, unlike previous descriptive studies, the ABM framework in this research identifies that the failure to improve environmental performance is often attributed to the absence of adaptive incentive mechanisms capable of stimulating green behavior among economic agents. Accordingly, the ABM serves as a dynamic laboratory for visualizing the behavioral feedback loops between green investment decisions and the resulting socio-economic benefits, while also providing an experimental mechanism for evaluating the effectiveness of maqashid-based policies.

*The Role of Agent-Based Model in the Transformation of Islamic Financial Governance*

The Agent-Based Model (ABM) approach enables this study to address the central question of how Islamic financial governance can evolve from a hierarchical system into an adaptive system driven by micro-level agent interactions. Through ABM simulations, the findings reveal that when local agents—such as Shariah cooperatives, Islamic boarding schools (pesantren), and waqf-based economic communities—are granted autonomy to manage maqashid-based instruments (e.g., productive zakat, micro green sukuk, and green waqf), an emergent governance pattern develops that is more responsive, inclusive, and resilient.

These findings extend the work of Widiastuti et al., (2022), who highlighted the integration model of Islamic social finance through the 4ER framework (Economic Rescue, Recovery, Reinforcement, and Resilience). However, this study demonstrates that the system's adaptive capacity increases significantly when social and environmental feedback mechanisms are incorporated into the dynamics of agents' investment decisions. This reinforces the principle that maqashidic finance cannot be achieved solely through top-down policies but requires bottom-up dynamics emerging from the collective behavior of agents.

In addition to providing empirical contributions, this study also offers a significant methodological advancement. By formalizing maqashid principles into a simulation algorithm, the Agent-Based Model (ABM) bridges the gap between the normative values of Islam and the complexities of economic reality. The model adopts the principles of bounded rationality and adaptive learning to predict the impact of financial policies on systemic stability and long-term sustainability. Accordingly, the findings of this research extend the perspective of Satyakti, (2023), who identified a positive relationship between maqashid and the competitiveness of Islamic bank financing; however, in this study, such a relationship is demonstrated dynamically through agent-based behavioral simulations.

*Transformation from Local Community to Global Market*

The findings of this study affirm that the transformation of Islamic financial governance from local communities to global markets requires two fundamental pillars. The first is institutional connectivity through Shariah-based green financial instruments, and the second is behavioral alignment through the internalization of maqashid values across all levels of economic actors.

This research extends the work of Faizi et al., (2024), who highlighted the potential of green sukuk as a financing source for sustainable projects in Indonesia. By employing the Agent-Based Model (ABM), this study demonstrates that the effectiveness of green sukuk increases when it is modularly integrated within microeconomic networks such as pesantren cooperatives or Islamic rural financial institutions. This mechanism enables adaptive agent responses to global policy changes and establishes functional linkages between Islamic social finance instruments (zakat, waqf, and microfinance) and global commercial finance (green bonds and impact investing).

Furthermore, the results reinforce the perspective of Raimi & Bamiro, (2025), who emphasized the strategic role of Islamic Sustainable Finance (ISF) in strengthening green entrepreneurship and accelerating the achievement of the Sustainable Development Goals (SDGs). The unique contribution of this study lies in developing an ABM-based multi-level governance framework that facilitates both vertical and horizontal integration across financial systems, without compromising maqashid al-shariah as the moral compass. Thus, the transformation from community to global markets is not only financial in nature but also epistemological and ethical.

## E. Conclusions & Policy Recommendation

### E.1. Conclusions

This study successfully fulfills its primary objective to analyze and reconstruct the Islamic financial system based on maqashid al-shariah and green economy principles through the Agent-Based Modeling (ABM) approach. The simulation results reveal that the dynamic interactions among agents regulators, Islamic financial institutions (IFI), and consumers generate adaptive patterns that shape the trajectory of financial system transformation toward sustainability. Green subsidy–based fiscal policies are shown to exert a stronger positive influence on green investment growth and income stability than standalone carbon tax policies. However, the combination of both instruments produces a synergistic effect that enhances efficiency and green economic resilience. These findings affirm that maqashid al-shariah can be dynamically operationalized through sustainable fiscal instruments, positioning the Islamic financial system not only as formally sharia-compliant but as substantively sharia-based, contributing meaningfully to socio-ecological balance.

Based on these results, the study recommends the design of a hybrid fiscal policy that integrates progressive carbon taxation with selective green subsidies to achieve a balance between economic incentives and environmental accountability. Regulators and Islamic financial authorities are encouraged to develop performance-based incentive mechanisms and green financial instruments aligned with maqashid al-shariah principles, such as environmental sukuk and waqf-based productive social funds. For future research, the ABM framework can be extended by incorporating macroeconomic and social variables, including green inflation, societal well-being indices, and adaptive mechanisms to external shocks. In doing so, subsequent studies are expected to strengthen both the theoretical and empirical foundations toward developing a more comprehensive, measurable, and applicable Maqashid–Green Adaptive Finance System (MGAFS) within the context of a sustainable global economy.

### E.2. Policy Recommendations

This study offers an epistemological advancement to Islamic finance theory by integrating Maqashid al-Shariah, the Green Economy, and Agent-Based Modeling (ABM) into a single, cohesive conceptual framework. This approach shifts the paradigm of Islamic finance from a normative system toward an empirically adaptive system grounded in agent behavior. Theoretically, the study introduces a new model, the Maqashidic Sustainability Model, which positions ecological sustainability as an essential dimension of modern maqashid objectives.

Practically, this model can be utilized by regulators and Islamic financial institutions to conduct ex-ante simulations of policy scenarios related to green financing, shariah governance, and socio-economic benefit redistribution. The application of ABM enables data-driven analyses of the effectiveness of instruments such as green sukuk, waqf-based investments, and zakat empowerment schemes. The resulting simulations provide a robust foundation for evidence-based policy design, promoting greater efficiency, transparency, and accountability.

For policymakers, this research recommends the development of a multi-layered governance policy that links local communities with global markets through incentive systems grounded in maqashid principles and sustainability values. Governments and Islamic financial authorities may adopt this model to strengthen the role of Islamic social finance as a cornerstone in the transition toward an equitable green economy, while simultaneously enhancing the international competitiveness of Islamic finance.

This study provides several significant contributions conceptual, methodological, empirical, and policy-oriented—to the development of a sustainable Islamic financial system. Conceptually, the research introduces a new model termed the Maqashidic Green Finance Ecosystem, an integrative framework that harmonizes the principles of maqashid al-shariah with the concept of the green economy within the structure of Islamic finance. Methodologically, the study pioneers the application of the Agent-Based Model (ABM) as a dynamic approach to simulate the complex interactions among Islamic economic agents in the context of sustainability. Empirically, the findings demonstrate that the integration between Islamic social finance and green finance strengthens local economic resilience while enhancing the connectivity of Islamic finance to global markets. From a policy perspective, the results propose a transformative governance framework that can serve as a reference for regulators and Islamic financial institutions in formulating policies oriented toward social justice, economic efficiency, and environmental sustainability.

## REFERENCES

Aboukhousa, H., Hassan, M. A., & Badran, M. A. (2024). Empowering environmental sustainability: Islamic values and their synergy with the SDGs. *Journal of Infrastructure, Policy and Development*. https://doi.org/10.24294/jipd10407

Al-Jayyousi, O., Tok, E., Saniff, S. M., Hasan, W. N. W., Janahi, N., & Yesuf, A. (2022). Re-Thinking Sustainable Development within Islamic Worldviews: A Systematic Literature Review. *Sustainability*. https://doi.org/10.3390/su14127300

Asutay, M. (2025). Islamic Moral Economy: Bringing Back Substantive Morality to Humanise Islamic Finance. *Global Policy*. https://doi.org/10.1111/1758-5899.13487

Ayub, M., Hassan, M., & Saba, I. (2023). Revisiting the paradigm of Sharīʿah governance of Islamic financial institutions. *Journal of Islamic Accounting and Business Research*. https://doi.org/10.1108/jiabr-04-2022-0110

Azmat, S., & Subhan, M. (2021). Ethical Foundations of the Islamic Financial Industry. *Journal of Business Ethics*, *180*, 567–580. https://doi.org/10.1007/s10551-021-04882-5

Bashori, Y. A., Umami, K., & Wahid, S. H. (2024). Maqasid shariah-based digital economy model: integration, sustainability and transformation. *Malaysian Journal of Syariah and Law*. https://doi.org/10.33102/mjsl.vol12no2.647

Boudawara, Y., Toumi, K., Wannes, A., & Hussainey, K. (2023). Shari'ah governance quality and environmental, social and governance performance in Islamic banks. A cross-country evidence. *Journal of Applied Accounting Research*. https://doi.org/10.1108/jaar-08-2022-0208

Bsoul, L. A., Omer, A., Kucukalic, L., & Archbold, R. (2022). Islam's Perspective on Environmental Sustainability: A Conceptual Analysis. *Social Sciences*. https://doi.org/10.3390/socsci11060228

Chebo, A., Dhliwayo, S., & Batu, M. (2024). The linkage between global financial crises, corporate social responsibility and climate change: unearthing research opportunities through bibliometric reviews. *Frontiers in Climate*. https://doi.org/10.3389/fclim.2024.1388444

Douven, I. (2024). Social Learning in Neural Agent-Based Models. *Philosophy of Science*, *92*, 141–161. https://doi.org/10.1017/psa.2024.33

Faizi, F., Kusuma, A. S., & Widodo, P. (2024). Islamic green finance: mapping the climate funding landscape in Indonesia. *International Journal of Ethics and Systems*. https://doi.org/10.1108/ijoes-08-2023-0189

Gao, C., Lan, X., Li, N., Yuan, Y., Ding, J., Zhou, Z., Xu, F., & Li, Y. (2023). Large Language Models Empowered Agent-based Modeling and Simulation: A Survey and Perspectives. *ArXiv*, *abs/2312.1*. https://doi.org/10.48550/arXiv.2312.11970

Gulzar, A., Islam, T., Khan, M. A., & Haq, S. M. (2021). Environmental Ethics towards Sustainable Development in Islamic perspective. *Ethnobotany Research and Applications*. https://doi.org/10.32859/era.22.39.1-10

Hadi, N., & Baihaqi, J. (2020). Motive of CSR Practices in Indonesia: Maqasid al-Sharia Review. *QIJIS (Qudus International Journal of Islamic Studies)*. https://doi.org/10.21043/qijis.v8i2.8856

Harahap, B., Risfandy, T., & Futri, I. N. (2023). Islamic Law, Islamic Finance, and Sustainable Development Goals: A Systematic Literature Review. *Sustainability*. https://doi.org/10.3390/su15086626

Hasnat, M. A., Khandakar, H., Rahman, M. A., Islam, S. N., & Hasan, K. K. (2025). Capitalism in modern ignorance (jahilliyah): exploring Islamic alternatives to reshape human behaviour and provide solutions for the 21st century. *International Journal of Islamic and Middle Eastern Finance and Management*. https://doi.org/10.1108/imefm-08-2024-0393

Irfany, M., Utami, A. D., Lubis, D., Ramadhini, F., Suwari, L. F., Maula, N. R., Fitriyatustany, F., & Haq, D. A. (2024). Islamic Finance and Environmental Sustainability: Empirical Insight from OIC Countries. *International Journal of Energy Economics and Policy*. https://doi.org/10.32479/ijeep.17400

Jan, A., Marimuthu, M., Hassan, R., & Mehreen. (2019). Sustainable Business Practices and Firm's Financial Performance in Islamic Banking: Under the Moderating Role of Islamic Corporate Governance. *Sustainability*. https://doi.org/10.3390/su11236606

Jan, A., Mata, M., Albinsson, P., Martins, J., Hassan, R., & Mata, P. (2021). Alignment of Islamic Banking Sustainability Indicators with Sustainable Development Goals: Policy Recommendations for Addressing the COVID-19 Pandemic. *Sustainability*. https://doi.org/10.3390/SU13052607

Julia, T., & Kassim, S. (2019). Exploring green banking performance of Islamic banks vs conventional banks in Bangladesh based on Maqasid Shariah framework. *Journal of Islamic Marketing*. https://doi.org/10.1108/JIMA-10-2017-0105

Kato, T. (2022). Islamic and capitalist economies: Comparison using econophysics models of wealth exchange and redistribution. *PLoS ONE*, *17*. https://doi.org/10.1371/journal.pone.0275113

Khan, I., Hameed, Z., Khan, S. U., & Khan, M. (2023). Green banking practices, bank reputation, and environmental awareness: evidence from Islamic banks in a developing economy. *Environment, Development and Sustainability*, 1–21. https://doi.org/10.1007/s10668-023-03288-9

Lai, J. (2021). Financialised ethics, economic security and the promise of Islamic finance. *Asian Journal of Comparative Politics*, *7*, 45–57. https://doi.org/10.1177/20578911211034723

Lu, Y., Aleta, A., Du, C., Shi, L., & Moreno, Y. (2024). LLMs and generative agent-based models for complex systems research. *Physics of Life Reviews*, *51*, 283–293. https://doi.org/10.1016/j.plrev.2024.10.013

Mergaliyev, A., Asutay, M., Avdukic, A., & Karbhari, Y. (2019). Higher Ethical Objective (Maqasid al-Shari'ah) Augmented Framework for Islamic Banks: Assessing Ethical Performance and Exploring Its Determinants. *Journal of Business Ethics*, *170*, 797–834. https://doi.org/10.1007/s10551-019-04331-4

Muhammad, R., Annuar, H. A., Taufik, M., & Nugraheni, P. (2021). The influence of the SSB's characteristics toward Sharia compliance of Islamic banks. *Cogent Business & Management*, *8*. https://doi.org/10.1080/23311975.2021.1929033

Mursid, M. C., Aziz, F. A., & Anjani, D. (2024). The role of sharia economics in realizing sustainable green economic development. *Journal of Infrastructure, Policy and Development*. https://doi.org/10.24294/jipd.v8i5.5012

Murtaza, M. R., Fan, H., Ullah, A., & Khan, S. (2024). The dynamic role of digital financial inclusion, sustainable energy transition, and governance in achieving global ecological sustainability. *Natural Resources Forum*. https://doi.org/10.1111/1477-8947.12557

Putri, V. R., Yunus, M. H. S. M., Zakaria, N. B., Zifi, M. P., Sastrodiharjo, I., & Dewi, R. (2024). Tax Avoidance with Maqasid Syariah: Empirical Insights on Derivatives, Debt Shifting, Transfer Pricing, and Financial Distress. *Journal of Risk and Financial Management*. https://doi.org/10.3390/jrfm17110519

Rahma, A.-S. T., & Elfaki, M. A. E. (2025). Islamic Finance as a Catalyst for Sustainable and Inclusive Industrial Development: A Comparative Analysis of Islamic and Conventional Financing Models Over 20 Years. *Journal of Posthumanism*. https://doi.org/10.63332/joph.v5i7.2826

Raimi, L., Abdur-Rauf, I. A., & Ashafa, S. A. (2024). Does Islamic Sustainable Finance Support Sustainable Development Goals to Avert Financial Risk in the Management of Islamic Finance Products? A Critical Literature Review. *Journal of Risk and Financial Management*. https://doi.org/10.3390/jrfm17060236

Raimi, L., & Bamiro, N. (2025). Role of Islamic sustainable finance in promoting green entrepreneurship and sustainable development goals in emerging Muslim economies. *International Journal of Social Economics*. https://doi.org/10.1108/ijse-05-2024-0408

Satyakti, Y. (2023). The Effect of Applying Sustainability (Maqasid Shariah) and Competition on Islamic Bank Financing. *Sustainability*. https://doi.org/10.3390/su151712994

Shalhoob, H. (2025). The role of AI in enhancing shariah compliance: Efficiency and transparency in Islamic finance. *Journal of Infrastructure, Policy and Development*. https://doi.org/10.24294/jipd11239

Sheraz, M., Deyi, X., Ahmed, J., Ullah, S., & Ullah, A. (2021). Moderating the effect of globalization on financial development, energy consumption, human capital, and carbon emissions: evidence from G20 countries. *Environmental Science and Pollution Research*, *28*, 35126–35144. https://doi.org/10.1007/s11356-021-13116-0

Suzuki, Y., & Miah, M. D. (2020). Shari'ah-compliant benchmark and Shari'ah-based "raf' al-haraj" benchmark on prohibition of riba. *International Journal of Islamic and Middle Eastern Finance and Management*. https://doi.org/10.1108/imefm-11-2019-0490

Ul-Haq, S., Lone, R. A., & Ashraf, N. (2020). A theory of capitalist co-optation of radical alternatives: The case of Islamic banking industry. *Organization*, *29*, 129–154. https://doi.org/10.1177/1350508420939245

Widiastuti, T., Ningsih, S., Prasetyo, A., Mawardi, I., Herianingrum, S., Robani, A., Al Mustofa, M. U., & Hady, A. F. (2022). Developing an integrated model of Islamic social finance: toward an effective governance framework. *Heliyon*, *8*(9), e10383. https://doi.org/https://doi.org/10.1016/j.heliyon.2022.e10383

Wisandani, I., Sukmawati, H., Joni, Mubarok, A. Z. S., Friantoro, D., & Febrianti, R. T. (2025). Revolutionizing Islamic Banking Metrics: Integrating Financial and Sharia-Based Indicators in Performance Evaluation. *Journal of Posthumanism*. https://doi.org/10.63332/joph.v5i4.1204

Yu, J., & Bagheri, N. (2020). Agent-Based Models Predict Emergent Behavior of Heterogeneous Cell Populations in Dynamic Microenvironments. *Frontiers in Bioengineering and Biotechnology*, *8*. https://doi.org/10.3389/fbioe.2020.00249

Yu, S. (2023). An Agent-Based Framework for Policy Simulation: Modeling Heterogeneous Behaviors With Modified Sigmoid Function and Evolutionary Training. *IEEE Transactions on Computational Social Systems*, *10*, 1901–1913. https://doi.org/10.1109/tcss.2022.3196737

Zain, F. A. M., Muhamad, S., Abdullah, H., Tajuddin, S. A. F. S. A., & Abdullah, W. A. W. (2024). Integrating environmental, social and governance (ESG) principles with Maqasid al-Shariah: a blueprint for sustainable takaful operations. *International Journal of Islamic and Middle Eastern Finance and Management*. https://doi.org/10.1108/imefm-11-2023-0422