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Integrating Green Economy and Hifd Bi'ah for Environmental Conservation: A Case Study of Eco-Friendly Agriculture in Pamekasan, Indonesia

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ABSTRACT

Background and research gap – Existing research has examined green economy policy and Islamic environmental ethics, but less is known about how resource-management practices and religious meanings are articulated together in local hydroponic farming.

Purpose – This study explores green economy-related agricultural practices and interpretations of environmental responsibility through the contemporary concept of ḥifẓ al-bīʾah in Ceguk Village, Tlanakan District, Pamekasan Regency, Indonesia

Design/methodology/approach – A descriptive qualitative single-case study was conducted from March to September 2025, drawing on field observations, documentation, and semi-structured interviews with seven purposively selected informants: three hydroponic farmers, two consumers or community members, one religious leader, and one Agricultural Office representative. Each informant was interviewed once for 30–45 minutes.

Key Findings – Findings identify reported limited-space cultivation, controlled water and nutrient management, reduced need for diesel-powered land preparation, household participation, and access to locally grown vegetables. Participants also expressed environmental responsibility through amānah (trust), justice, spiritual blessing, and ḥifẓ al-bīʾah. Critically, the evidence supports religious-ethical articulation and reports of agricultural practices but does not establish that religious beliefs caused specific farming decisions or that these practices achieved measurable environmental improvements. Employment creation and comprehensive household food security were not independently established.

Research limitations/implications – By distinguishing ethical articulation, behavioural enactment, and environmental performance, the study offers a context-specific analytical contribution rather than a validated conservation model.

Originality/value – Its implications concern the potential relevance of locally meaningful ethical perspectives alongside technical and socioeconomic considerations, without assuming their universal applicability.

Keywords: green economy, environmental conservation, islamic environmental ethics, hifz bi'ah, sustainable agriculture.

INTRODUCTION

Environmental sustainability has become an increasingly important concern in Indonesia, where agricultural development is closely connected to natural resource management and community livelihoods. Environmental challenges, including land degradation, pollution, and climate change, highlight the need for agricultural practices that balance economic activities with ecological responsibility. In this context, the green economy offers a framework for promoting sustainable development through resource efficiency, environmental risk reduction, and social inclusion. The United Nations Environment Programme conceptualises an inclusive green economy as one that improves human well-being and social equity while reducing environmental risks and ecological scarcities.[1] Translating these principles into local agricultural practices, however, requires attention not only to production techniques but also to the social and cultural contexts in which agricultural activities take place.

[1] UNEP, "What Is an 'Inclusive Green Economy'?," *UNEP*, last modified 2008, accessed October 12, 2026, https://www.unep.org/explore-topics/green-economy/why-does-green-economy-matter/what-inclusive-green-economy.

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Hydroponic agriculture represents one approach through which selected green economy principles may be explored at the local level. As a cultivation system that does not rely on agricultural soil, hydroponics can facilitate production within limited spaces and enable more controlled management of water and nutrient inputs. Previous research has identified potential advantages of hydroponic cultivation in terms of land utilisation and water management, while also highlighting challenges associated with energy requirements, operational costs, and technical expertise.[2] Consequently, hydroponic cultivation should not automatically be regarded as environmentally sustainable solely because it uses limited land or controlled irrigation. Its environmental performance depends on the characteristics and management of the production system. Beyond technical considerations, examining household participation and access to locally produced vegetables may also provide insights into the social dimensions of agricultural practices associated with the green economy.

In Muslim-majority settings, environmental responsibility may also be understood through religious beliefs and ethical commitments. Islamic teachings concerning *amānah*, *khilāfah*, justice, and *mīzān* provide important perspectives on the relationship between human activities and the natural environment. These principles have informed contemporary discussions of *ḥifẓ al-bīʾah* within the framework of *maqāṣid al-sharīʿah*, or the higher objectives of Islamic law.[3] Although environmental preservation was not explicitly established as an independent category within the classical five essential objectives, contemporary Islamic scholars have examined its relevance to the protection of human welfare and ecological balance.[4] In this study, ḥifẓ al-bīʾah is therefore understood as a contemporary religious-ethical perspective through which participants' interpretations of environmental responsibility can be examined, rather than as an uncontested classical legal category.

Existing scholarship has addressed different aspects of environmentally oriented economic development. For example, Wang et al. investigated the relationships between green credit policies, economic performance, and environmental outcomes, providing evidence from a broader economic and policy context.[5] Meanwhile, Pomoni et al. examined resource use and environmental trade-offs associated with hydroponic cultivation, demonstrating the relevance of agricultural production systems to

[2] Dimitra I. Pomoni et al., "A Review of Hydroponics and Conventional Agriculture Based on Energy and Water Consumption, Environmental Impact, and Land Use," Energies 16, no. 4 (2023): 1690, https://doi.org/10.3390/en16041690.

[3] Ahmad Sarip Saputra, Ida Rohmah Susiani, and Nur Syam, "Hifdh Al-Bī'ah as Part of Maqāṣid Al-Sharī'ah: Yūsuf Al-Qarḍāwy's Perspective on the Environment in Ri'āyat Al-Bī'ah fi Sharī'ah Al-Islām," AIP Conference Proceedings 2353 (2021): 030106, https://doi.org/10.1063/5.0052768.

[4] Mohammad Hashim Kamali, "Maqasid and Protection of the Environment (Hifz al-Bi'ah)," in Goals and Purposes of Shariah: Maqasid in Theory and Practice (Oxford: Oxford University Press, 2025), 260–81, https://doi.org/10.1093/9780197786390.003.0028; M. Khusnul Khuluq and Asmuni, "Hifz Al-Bi'ah as Part of Maqashid Al-Shari'ah and Its Relevance in the Context of Global Climate Change," Indonesian Journal of Interdisciplinary Islamic Studies (IJIIS) 7, no. 2 (2025): 162–78, https://doi.org/10.20885/ijiis.vol7.iss2.art3.

[5] Yanli Wang et al., "The Dual Impacts of Green Credit on Economy and Environment: Evidence from China," Sustainability 13, no. 8 (2021): 4574, https://doi.org/10.3390/su13084574.

sustainability debates.[6] From an Islamic perspective, Khuluq and Asmuni and Kamali have contributed to contemporary discussions of environmental preservation within *maqāṣid al-sharīʿah*.[7] These studies provide useful but distinct perspectives on green economic development, agricultural resource management, and Islamic environmental ethics. Building on these contributions, further context-specific empirical understanding is needed concerning how local agricultural actors describe resource-management practices and how religious values are interpreted in relation to those practices. In particular, the relationship between everyday hydroponic cultivation and the lived religious meanings associated with environmental responsibility warrants closer qualitative examination.

To address this empirical and interpretive gap, the present study explores green economy-related agricultural practices and religious-ethical understandings of environmental responsibility in Ceguk Village, Tlanakan District, Pamekasan Regency, Indonesia. Using a descriptive qualitative single-case study approach, the research draws on semi-structured interviews, field observations, and relevant documentation to examine two interconnected questions: (1) How do participants describe and experience agricultural practices associated with green economy principles, particularly in relation to resource management, household participation, and access to locally produced vegetables? and (2) How do participants interpret environmental responsibility through Islamic religious values, particularly the contemporary concept of *ḥifẓ al-bīʾah*? Rather than measuring ecological impacts or establishing causal relationships, the study seeks to provide a context-specific understanding of the practical and religious-ethical dimensions of hydroponic agriculture. Its contribution lies in bringing these two perspectives into dialogue through empirical evidence from a local case, while offering exploratory insights relevant to community-based agricultural development and future research on environmentally responsible practices in Muslim-majority rural settings.

METHODS

This study employed a descriptive qualitative single-case study design to explore green economy-related agricultural practices and religious-ethical interpretations of environmental responsibility through the contemporary concept of *ḥifẓ al-bīʾah* (environmental preservation). The research was conducted from March to September 2025 in Ceguk Village, Tlanakan District, Pamekasan Regency, East Java, Indonesia.

The qualitative case-study approach was adopted to examine agricultural practices and their associated social and religious meanings within a bounded local setting.[8] The unit of analysis was hydroponic agricultural practice and its interpretation within the Ceguk Village case, rather than individual farmers or the wider agricultural community. Particular attention was directed towards resource management, household participation, perceived environmental responsibility, and Islamic religious-ethical understandings.

The research was grounded in empirical material collected through semi-structured interviews, direct field observations, and relevant documentation. Literature

[6] Pomoni et al., "A Review of Hydroponics and Conventional Agriculture Based on Energy and Water Consumption, Environmental Impact, and Land Use."

[7] Khuluq and Asmuni, "Hifz al-Bi 'ah as Part of Maqashid al-Shari 'ah and its Relevance in the Context of Global Climate Change"; Kamali, "Maqasid and Protection of the Environment (Hifz Al-Bi'ah)."

[8] Robert K. Yin, Case Study Research and Applications: Design and Methods, 6th ed. (Los Angeles: SAGE, 2018).

concerning the green economy, hydroponic agriculture, and Islamic environmental ethics was used to inform the conceptual framework and interpret the empirical findings.

Seven key informants were selected using purposive sampling based on their involvement in, experience with, or relevant knowledge of the hydroponic agricultural activities examined in the study. The participants comprised three hydroponic farmers or business owners, two community members or consumers, one village religious leader, and one representative of the Department of Agriculture.

Participant selection was guided by the need to obtain perspectives relevant to the two research objectives. Hydroponic farmers or business owners were included to provide accounts of cultivation practices and agricultural resource management. Community members or consumers contributed perspectives concerning agricultural products, household access to vegetables, and perceived product quality. The religious leader was included to explore Islamic ethical interpretations of environmental responsibility, while the Agricultural Office representative provided an institutional perspective on agricultural practices and related environmental concerns.

The sample was intended to provide information from different participant roles within a narrowly bounded case rather than statistical representation of the wider population. Its adequacy was considered in relation to the focused research objectives and the relevance of participants' knowledge, consistent with the principle of information power in qualitative interview research.[9] The study does not claim statistical representativeness or thematic saturation.

Data were collected from March to September 2025 through semi-structured interviews, direct field observations, and documentation. Each of the seven informants participated in one interview lasting approximately 30–45 minutes. Interviews were conducted in a combination of Madurese and Indonesian, reflecting participants' linguistic preferences. With participants' informed consent, interviews were audio-recorded and supplemented by written notes.

Interview excerpts selected for presentation in the article were translated into English and checked against the original audio recordings and written notes, as described in the research procedures. Attention was directed towards preserving the intended meanings of local expressions and religious terminology, particularly statements concerning environmental responsibility and Islamic ethical values.

Field observations were conducted at hydroponic cultivation sites in Ceguk Village. Observational attention focused on cultivation spaces, irrigation arrangements, agricultural equipment, and activities associated with planting and harvesting. Field notes were used to document observable practices and contextual information relevant to the research questions.

Documentary materials, including cultivation records and village documents, were examined to provide additional contextual information and, where relevant, to support the interpretation of interview accounts. Interview evidence, field observations, and documentary materials were treated as distinct sources of qualitative information. Participants' descriptions of resource efficiency, environmental benefits, and

[9] Kirsti Malterud, Volkert Dirk Siersma, and Ann Dorrit Guassora, "Sample Size in Qualitative Interview Studies: Guided by Information Power," Qualitative Health Research 26, no. 13 (2016): 1753–1760, https://doi.org/10.1177/1049732315617444.

socioeconomic opportunities were therefore not automatically regarded as independently verified outcomes.

The study did not conduct quantitative measurements of water consumption, energy use, carbon emissions, water pollution, pesticide residues, or other environmental performance indicators.

The qualitative material was analysed using the interactive framework of Miles, Huberman, and Saldaña,[10] involving data condensation, data display, and conclusion drawing and verification. The coding approach combined theory-informed categories with attention to additional meanings emerging from the empirical material.

The analysis was organised around two theory-informed domains corresponding to the research objectives. The first concerned green economy-related agricultural practices, including land utilisation, water and nutrient management, agricultural equipment, reported pesticide practices, household participation, and access to locally produced vegetables. The second concerned religious-ethical interpretations of environmental responsibility, including *amānah*, environmental justice, perceived food cleanliness and goodness, spiritual reassurance, and *ḥifẓ al-bīʾah* as an ethical guideline.

Interview material, observational notes, and relevant documentary information were examined in relation to these analytical domains while allowing additional contextual meanings to be identified from the empirical material. Relevant statements were grouped into thematic categories to facilitate interpretation.

The findings were organised into two principal thematic areas. The first addressed reported agricultural practices associated with selected green economy principles, while the second examined participants' religious-ethical understandings of environmental responsibility. These areas formed the basis of the qualitative interpretations presented in Tables 1 and 2.

During interpretation, attention was given to distinguishing reported agricultural activities, directly observed contextual information, personal perceptions, and normative religious statements. The consistency of thematic interpretations was assessed by revisiting the original interview material and comparing it with available observation notes and documentary sources where relevant. The analysis did not treat the coexistence of religious meanings and agricultural practices as evidence of a causal relationship.

The researcher served as the primary instrument of qualitative data collection and interpretation, drawing on an academic background in Islamic economics and environmental studies. Given this disciplinary perspective, particular consideration was given to the possibility that prior theoretical understandings could influence the interpretation of participants' accounts.

Reflexive attention was directed towards distinguishing the participants' own religious understandings from interpretations informed by contemporary Islamic environmental scholarship. Analytical notes and repeated examination of the original interview materials were used, as reported in the study procedures, to maintain consistency between participants' statements and the themes developed during analysis.

The credibility of the findings was supported by comparing interview accounts with available observational and documentary information where appropriate. The study

[10] Matthew B. Miles, A. Michael Huberman, and Johnny Saldaña, Qualitative Data Analysis: A Methods Sourcebook, 3rd ed. (Thousand Oaks, CA: SAGE Publications, 2014).

also maintained a distinction between participants' perceptions and independently measured environmental outcomes, which were outside the scope of the research.

Accordingly, the findings are presented as context-specific qualitative interpretations of hydroponic agricultural practices and religious-ethical meanings rather than representative conclusions or evidence of verified ecological effectiveness.

RESULT

Exploring the Application of Green Economy in the Context of Environmental Conservation.

In the context of green economy implementation, environmentally oriented agricultural practices may contribute to more efficient resource utilisation and environmentally conscious production. Interviews with selected participants indicate that certain agricultural practices incorporate elements associated with green economy principles, particularly small-scale land utilisation, controlled water use, and reduced reliance on fuel-powered agricultural machinery. Participants also described opportunities for household involvement and access to locally produced vegetables. These findings reflect the experiences and perceptions of the interviewed participants rather than representing agricultural practices across the wider community. Therefore, the transferability of these findings to other agricultural settings should be considered in relation to differences in production systems, resource availability, and local socioeconomic conditions.

Table 1. Interview-Based Evidence of Green Economy-Related Agricultural Practices

No	Interview Narrative Excerpts	Informant	Qualitative Interpretation
1	"As far as I know, this planting activity does not require a large area of land; it can even be done at home. So, there is no need for heavy equipment or tractors that use diesel fuel."	Mrs. Linda	Small-scale land utilisation and reported reduced need for diesel-powered land preparation
2	"Because water usage is controlled, there is no waste. Water and nutrients can be adjusted as needed."	Mrs Nur Laila	Reported water-use control and resource management practices
3	"We at the agency believe that this farming method is environmentally friendly because it does not use pesticides and causes very little water pollution."	Mr. Sapri (Department of Agriculture)	Reported pesticide avoidance and perceived low potential for water pollution
4	"Young people who are not in school can help with planting or harvesting. Mothers are also happy because they can do the work at home."	Mrs. Alfina	Opportunities for household-based participation among women and out-of-school youth
5	"The harvest can also be sold at the market. Some households are now able to harvest their own produce, so they don't have to buy vegetables from outside."	Mr. Fahri	Reported household access to home-grown vegetables and potential market participation

Table 1 presents interview-based evidence of agricultural practices associated with selected principles of the green economy. The participants' accounts highlight several practices, including small-scale land utilisation, controlled water use, reported avoidance of pesticides, and reduced reliance on diesel-powered machinery for land preparation. These practices suggest potential opportunities for resource-conscious agricultural production, although their environmental benefits have not been independently quantified. In addition, the interviews indicate opportunities for household-based participation, particularly among women and out-of-school youth, as well as improved access to home-grown vegetables among some households. These findings illustrate how the interviewed participants perceive and experience the environmental and socioeconomic aspects of small-scale agriculture. Nevertheless, the evidence does not establish measurable reductions in carbon emissions, improvements in water quality, employment creation, or comprehensive food security. Given the limited and context-specific interview evidence, the findings should be understood as exploratory insights into green economy-related agricultural practices rather than as representative evidence of their widespread implementation or verified ecological impacts.

Religious-Ethical Perspectives on Environmental Conservation: Exploring Ḥifẓ al-Bīʾah in Agricultural Practices

Beyond technical considerations, the interviews reveal how religious beliefs and spiritual values inform participants' understandings of environmental responsibility in agricultural practices. These perspectives can be examined through the contemporary concept of *ḥifẓ al-bīʾah*, which has been developed in Islamic scholarship as an extension of *maqāṣid al-sharīʿah* rather than as an explicitly established category within the classical five essential objectives.[11] Participants associated environmental responsibility with the Islamic principles of trust, justice, and the avoidance of environmental harm. Some also described the cleanliness and perceived goodness of agricultural products in relation to household well-being and spiritual reassurance. These accounts suggest that, among the interviewed participants, agricultural practices carry religious and ethical meanings alongside their practical and economic purposes. However, these perspectives represent participants' reported beliefs and interpretations rather than independently verified environmental outcomes.

Table 2. The Concept of Hifd bi'ah in the Ecological Awareness of Society

No	Interview Narrative Excerpts	Informant	Qualitative Interpretation
1	Vegetables grown using this method are cleaner and free from pesticides. So they are healthier for children.	Mrs. Luluk	Perceived food cleanliness and healthfulness associated with reported pesticide avoidance
2	Islam teaches us to protect nature. Nature is a trust from Allah, so we must not destroy it.	Kiai Yamin	Environmental stewardship understood as a religious responsibility rooted in amānah

[11] M. Khusnul Khuluq and Asmuni, "Hifz Al-Bi ' ah As Part of Maqashid Al-Shari ' ah and its Relevance In the Context of Global Climate Change," *Indonesian Journal of Interdisciplinary Islamic Studies (IJIIS)* 7, no. 2 (2025): 162–178; Mohammad Hashim Kamali, "Maqasid and Protection of the Environment (Hifz Al-Bi'ah)," in *Goals and Purposes of Shariah: Maqasid in Theory and Practice* (Oxford University Press, 2025), https://doi.org/10.1093/9780197786390.003.0028.

3	If agriculture damages water or soil, it violates the principle of justice in Islam.	Mr. Sapri (Department of Agriculture)	An institutional actor's interpretation of environmental protection as an expression of Islamic justice
4	"If the results are good and clean, we can eat with peace of mind, especially when we want to pray or break our fast. It feels more blessed."	Mrs. Nur Laila	Perceived spiritual reassurance and blessing associated with clean agricultural produce
5	"I think hifd bi'ah can be a guiding principle. So we don't just think about profit, but also about the environment."	Kiai Yamin	Ḥifẓ al-bīʾah perceived as an ethical guideline for balancing economic interests and environmental responsibility

Source: Authors' data processing, 2025.

Table 2 illustrates how the interviewed participants interpreted agricultural practices through religious and ethical perspectives associated with environmental responsibility. Kiai Yamin emphasised the understanding of nature as a divine trust and regarded *ḥifẓ al-bīʾah* as a potential ethical guideline for considering environmental concerns alongside economic interests. Similarly, Mr. Sapri, representing the Department of Agriculture, associated environmental degradation with the Islamic principle of justice. His statement reflects an institutional actor's ethical interpretation rather than an authoritative religious ruling, although it is conceptually consistent with Islamic teachings concerning the prevention of harm and the preservation of balance in nature. Meanwhile, Mrs. Luluk associated reported pesticide avoidance with perceived food cleanliness and healthfulness, a concern that may be considered in relation to the broader ethical notion of *ṭayyib*, without establishing halal status or independently verified food safety. Mrs. Nur Laila expressed a personal sense of spiritual reassurance and blessing associated with consuming agricultural products she considered clean and good. Taken together, these accounts suggest that religious values provide a meaningful interpretive framework through which these participants understand environmental responsibility in agriculture. Nevertheless, the findings demonstrate perceived ethical orientations and lived spiritual meanings rather than measurable ecological improvements. The extent to which such values influence sustained environmental practices requires further empirical investigation.

DISCUSSION

The findings of this study raise an important question regarding the relationship between green economy-related agricultural practices and Islamic environmental ethics: to what extent do environmentally oriented practices reflect religious commitments, and to what extent do religious values provide ethical interpretations of existing agricultural activities? The evidence from Ceguk Village indicates that both dimensions are present within the local hydroponic farming context, although their relationship is more clearly established at the interpretive level than through demonstrated behavioural mechanisms. Participants described practices involving limited land utilisation, controlled water and nutrient management, reported pesticide avoidance, household

participation, and access to locally produced vegetables. At the same time, selected participants articulated environmental responsibility through Islamic concepts such as *amānah*, justice, spiritual blessing, and *ḥifẓ al-bīʾah*. The analytical significance of these findings lies not in demonstrating that religious values directly produce sustainable agricultural behaviour, but in examining how practical agricultural experiences and religious-ethical meanings coexist and may be interpreted in relation to one another.

The findings offer a local perspective on established discussions of green economic development. Previous studies, including Wang et al. and Chaaben et al., have examined green economy performance primarily through economic, environmental, and policy-related indicators at broader analytical scales.[12] Such research contributes to understanding the structural dimensions of sustainable development, but its methodological orientation differs from the present study's examination of individual accounts within a rural agricultural setting. This difference does not suggest that existing green economy frameworks neglect ethical considerations. The United Nations Environment Programme, for example, explicitly incorporates social equity and human well-being into its inclusive green economy framework.[13] Rather than challenging the ethical foundations of these approaches, the present findings offer a context-specific perspective on how resource-management practices and environmental responsibility are understood in a setting where Islamic religious values are socially meaningful.

A critical interpretation of the agricultural findings requires distinguishing between resource-conscious practices and demonstrated environmental performance. Mrs. Linda's account suggests that hydroponic cultivation can be undertaken on limited land without conventional diesel-powered land preparation. However, this characteristic may reflect the technical requirements of soilless cultivation rather than an intentional decision to minimise fossil-fuel consumption. Furthermore, the reduced need for tractors does not necessarily indicate lower overall energy consumption, since hydroponic systems may require electricity and other operational inputs. Similarly, Mrs. Nur Laila's description of controlled water and nutrient application indicates an ability to regulate agricultural inputs, but does not establish the actual volume of water saved or the system's comparative efficiency. These distinctions are consistent with Pomoni et al., who identified potential advantages of hydroponic agriculture in land and water management while also acknowledging trade-offs involving energy requirements and production costs.[14] Consequently, the environmental significance of the reported practices cannot be assessed solely from their technical characteristics.

This critical distinction also applies to the reported avoidance of pesticides and perceived low water pollution. Mr. Sapri's account reflects a favourable institutional assessment of hydroponic cultivation, but the study does not provide independent evidence concerning pesticide residues, nutrient discharge, or water quality. His statement is therefore relevant to understanding how the agricultural method is perceived rather than establishing its ecological effectiveness. More broadly, the

[12] Yuming Zhang, Chao Xing, and Yuan Wang, "Does Green Innovation Mitigate Financing Constraints? Evidence from China's Private Enterprises," Journal of Cleaner Production 264 (2020): 121698, https://doi.org/10.1016/j.jclepro.2020.121698; Nahla Chaaben et al., "Green Economy Performance and Sustainable Development Achievement: Empirical Evidence from Saudi Arabia," Environment, Development and Sustainability 26 (2024), https://doi.org/10.1007/s10668-022-02722-8.

[13] UNEP, "What Is an 'Inclusive Green Economy'?"

[14] Pomoni et al., "A Review of Hydroponics and Conventional Agriculture Based on Energy and Water Consumption, Environmental Impact, and Land Use."

adoption of a cultivation system associated with environmentally responsible production should not be equated with verified environmental conservation. The present findings illustrate this distinction by identifying practices potentially consistent with green economy principles while leaving their environmental outcomes empirically unresolved.

The socioeconomic findings reveal a comparable tension between opportunities for participation and demonstrated social benefits. Mrs. Alfina's description of planting and harvesting activities suggests that hydroponic cultivation may provide opportunities for women and out-of-school youth to participate in household-based agricultural production. Nevertheless, participation alone does not establish economic empowerment. Such involvement could represent productive opportunities, but it could also involve unpaid work or additional household responsibilities. The available evidence does not allow these possibilities to be distinguished. Likewise, Mr. Fahri's account of vegetable sales and household consumption suggests potential contributions to market participation and local food access, but does not demonstrate increased household income or comprehensive food security. These findings reinforce the need to differentiate the social opportunities associated with agricultural activities from their actual distributive and economic consequences. They also indicate that the inclusive dimensions of the green economy require empirical attention to the conditions and benefits of participation, rather than merely documenting its possibility.

From the perspective of Islamic environmental ethics, the findings invite a critical distinction between normative religious principles and their practical expression in agricultural behaviour. Kiai Yamin's interpretation of nature as a divine trust reflects the principle of *amānah*, while his understanding of *ḥifẓ al-bīʾah* emphasises the ethical importance of considering environmental responsibility alongside economic interests. These interpretations are consistent with contemporary discussions of environmental protection within *maqāṣid al-sharīʿah*, particularly those advanced by Khuluq and Asmuni and Kamali.[15] Nevertheless, the presence of such ethical principles within religious discourse does not establish that they directly determine agricultural decisions. The distinction between affirming environmental responsibility and demonstrating its influence on behaviour is crucial to evaluating the practical relevance of Islamic environmental ethics.

This interpretation also helps clarify the study's relationship with previous scholarship. Acim and Suharti examined Islamic environmental jurisprudence through Qur'anic interpretation and interviews with religious scholars in Lombok,[16] while Latifah explored the relationship between *fiqh al-bīʾah*, green and blue economy principles, and sustainable development through a literature-based approach.[17] These studies demonstrate that Islamic environmental responsibility has already been examined from normative, conceptual, and empirical perspectives. The present research does not introduce Islamic environmental ethics as a new theoretical concept or establish its

[15] Kamali, "Maqasid and Protection of the Environment"; Khuluq and Asmuni, "Hifz Al-Bi'ah as Part of Maqashid Al-Shari'ah."

[16] Subhan Abdullah Acim and Suharti, "The Concept of Fiqh Al-Bī'ah in the Qur'an: A Study of the Quranic Verses on Environment in the Ulamas' Views of Lombok," Ulumuna 27, no. 1 (2023): 115–40, https://doi.org/10.20414/ujis.v27i1.694.

[17] Latifah, "Fiqh Al-Bī'ah and the Concept of Green and Blue Economy."

practical effectiveness for the first time. Its contribution is more specific: it considers how religious-ethical interpretations appear alongside reported agricultural practices within a particular hydroponic farming context, thereby bringing questions of resource management and lived religious meaning into the same empirical analysis.

The differences among participants' religious interpretations are particularly important. Kiai Yamin emphasised the obligation to protect nature, while Mr. Sapri framed environmental damage through the Islamic principle of justice. These perspectives concern ethical responsibility towards the environment. By contrast, Mrs. Luluk associated reported pesticide avoidance with perceptions of cleaner and healthier vegetables, while Mrs. Nur Laila expressed spiritual reassurance and blessing in relation to agricultural products perceived as clean and good. Although these accounts share a broad religious and ethical orientation, they do not express identical concerns. The former emphasise environmental obligations, whereas the latter relate more directly to perceived product quality, household well-being, and personal spiritual experience. Treating all these accounts as evidence of a uniform ecological consciousness would obscure their different meanings. Moreover, perceived cleanliness and spiritual blessing should not be interpreted as proof of nutritional superiority, halal certification, or independently verified environmental benefits.

The relationship between religious beliefs and agricultural practices becomes particularly significant when individual accounts are examined across the two thematic areas. Mrs. Nur Laila, for example, described the controlled management of water and nutrients while also associating agricultural products with spiritual reassurance. This provides evidence that resource-management practices and religious meanings appear within the same participant's experience. However, the interviews do not establish that her religious beliefs motivated the decision to regulate water and nutrient inputs. Similarly, Mr. Sapri expressed both a positive assessment of hydroponic practices and a religious interpretation of environmental justice, but did not identify a specific agricultural decision resulting from that belief. These examples indicate a possible interpretive relationship between environmental practices and religious values, without demonstrating the direction or strength of behavioural influence.

Alternative explanations must therefore be considered when interpreting agricultural choices. The adoption of hydroponic cultivation may be associated with limited land availability, technical characteristics of the system, household convenience, expectations of economic benefit, or access to cultivation resources. These factors may operate independently of religious commitments or interact with them in ways that the available evidence cannot determine. Religious values may also provide an ethical language for evaluating or justifying agricultural practices after their adoption, rather than necessarily functioning as their initial motivation. This possibility is analytically important because it challenges the assumption that the coexistence of religious values and environmentally oriented practices constitutes direct evidence of religiously driven behaviour. The present study did not systematically examine these alternative explanations; therefore, none can be identified as the predominant determinant of agricultural decisions.

The findings consequently support a distinction between three analytical dimensions: ethical articulation, behavioural enactment, and environmental performance. Ethical articulation concerns how participants express religious responsibilities and environmental values. Behavioural enactment concerns whether

those values influence identifiable decisions and actions in agricultural production. Environmental performance concerns the measurable ecological consequences of those actions. The present study provides evidence of religious-ethical articulation and reported agricultural practices, but does not establish a consistent decision-making pathway connecting the two or independently verify their environmental outcomes. This distinction helps explain why conceptual compatibility between the green economy and *ḥifẓ al-bīʾah* should not be interpreted as proof of their effective integration. It also provides a more precise basis for future research examining the conditions under which religious values may influence agricultural behaviour.

The institutional context introduces an additional dimension that remains insufficiently documented in the present case. Although the study included a representative of the Department of Agriculture, the evidence does not establish the extent of support provided by village government, farmer organisations, agricultural extension services, or religious institutions. Consequently, it would be inappropriate to conclude that institutional arrangements are absent or that institutional weaknesses have prevented the development of environmentally oriented agriculture. Nevertheless, institutional conditions may be relevant to the continuity of resource-management practices because agricultural knowledge, access to equipment, financial resources, and organisational support can influence production decisions. These remain plausible areas for further investigation rather than empirically demonstrated barriers within Ceguk Village.

The broader implication of these findings is that environmental responsibility may acquire different practical and ethical meanings depending on the social context in which agricultural activities take place. In rural settings where Islamic values are important to everyday life, *ḥifẓ al-bīʾah* may provide a meaningful perspective for discussing responsible resource use and the ethical consequences of economic activities. However, its relevance should not be understood as a universal requirement for implementing green economy principles. Technical considerations, economic opportunities, institutional arrangements, and local cultural values may all contribute to agricultural decision-making. A context-sensitive approach therefore requires attention to these dimensions without assuming that religious commitments necessarily generate environmentally sustainable outcomes.

These interpretations must also be considered in relation to the methodological boundaries of the study. The research involved seven purposively selected informants within a single case in Ceguk Village, with each participant interviewed once for approximately 30–45 minutes during the March–September 2025 research period. Although the study incorporated field observations and documentary materials, it did not provide longitudinal evidence of changes in religious attitudes or agricultural behaviour, nor did it independently measure environmental or socioeconomic performance. The available interviews also did not consistently document participants' decision-making processes, limiting the possibility of reconstructing direct mechanisms linking ethical beliefs to agricultural practices. Future research could address these limitations through repeated interviews focused on specific agricultural decisions, comparative investigation of farming systems, assessment of institutional conditions, and quantitative environmental measurements.

The findings indicate that *ḥifẓ al-bīʾah* is more clearly demonstrated as a religious-ethical perspective through which selected participants understand environmental responsibility than as an empirically verified determinant of agricultural behaviour. Similarly, the relevance of hydroponic cultivation to green economy principles is supported by accounts of selected resource-management and household-related practices rather than measured environmental or socioeconomic outcomes. The contribution of this study therefore lies in critically examining both the conceptual correspondence and the empirical limitations of the relationship between green economy practices and Islamic environmental ethics. By distinguishing religious interpretations, agricultural decision-making, and environmental performance, the study provides a context-specific analytical foundation for further investigation of environmentally responsible agriculture in Muslim-majority rural settings.

CONCLUSION

This study examined green economy-related agricultural practices and Islamic religious-ethical interpretations of environmental responsibility within hydroponic cultivation in Ceguk Village, Tlanakan District, Pamekasan Regency, Indonesia. The findings indicate that participants reported agricultural practices consistent with selected green economy principles, including limited-space cultivation, controlled water and nutrient management, reduced reliance on diesel-powered land preparation, household participation, and access to locally produced vegetables. Religious-ethical interpretations emphasised *amānah*, environmental justice, spiritual blessing, and *ḥifẓ al-bīʾah*. However, the coexistence of these practices and religious meanings does not establish that Islamic ethical values directly motivated agricultural decisions or that hydroponic cultivation achieved measurable environmental improvements. The findings therefore demonstrate the relevance of both practical and religious-ethical perspectives within the local case rather than the proven effectiveness of an integrated environmental conservation model.

The principal contribution of this study lies in critically distinguishing three analytical dimensions: ethical articulation, behavioural enactment, and environmental performance. While the findings provide evidence of participants' religious-ethical interpretations and reported agricultural practices, they do not establish a direct behavioural mechanism connecting these dimensions or independently verify their ecological consequences. This distinction contributes to a more nuanced understanding of the relationship between green economy principles and contemporary Islamic environmental ethics by recognising that conceptual compatibility does not necessarily imply behavioural integration or environmental effectiveness. In contexts where Islamic values are socially meaningful, *ḥifẓ al-bīʾah* may provide an additional ethical perspective for environmental education and community-based agricultural initiatives. Nevertheless, its practical relevance should be considered alongside technical, socioeconomic, and institutional conditions rather than treated as a universal requirement for sustainable development.

The findings should be interpreted within the methodological boundaries of a single qualitative case study involving seven purposively selected informants in Ceguk Village. Each participant was interviewed once for approximately 30–45 minutes during the March–September 2025 research period, with interviews complemented by field observations and documentation. The study did not independently measure

environmental performance or socioeconomic impacts, nor did the available evidence establish how religious beliefs influenced specific agricultural decisions or how institutional arrangements supported the continuity of agricultural practices. Consequently, the findings offer context-specific analytical insights rather than causal or generalisable conclusions. Future research should investigate agricultural decision-making through longitudinal and comparative qualitative studies, complemented where appropriate by environmental measurements and institutional analysis, to clarify the conditions under which religious-ethical values may influence environmentally responsible agricultural practices.

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Fahrurrozi: Contribute to formulating research ideas, collecting data, processing data, and interpreting data
Zainal Abidin: Contributing to writing systematics, researchmethods, analyzing interpretation results.
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The author declares that there is no conflict of interest.
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Ethical approval No patient-identifying parts in this paper were used or known to the authors. Therefore, no ethical approval was requested.

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