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The Eco-Agriculture Pivoted on *Maqāṣid Asy-Syarī'ah*: A Qualitative Dynamic System Analysis for Food Security

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Abstract: This study aims to create a sustainable and innovative agricultural ecosystem by emphasising the importance of human effort in critically assessing and sustaining their lives amid unpredictable natural conditions. By employing a dynamic qualitative approach and developing a reproducible analysis model, we gathered primary data through observations and interviews in Sarwadadi Village, Talun, Cirebon, alongside secondary data from online research publications. The findings revealed strong collaboration among farmers, local government, academics, and agricultural experts; the potential for eco-friendly and productive land use; and the establishment of a conceptual model for the qualitative dynamics of environmental conservation (*fiqh al-bī'ah*), which includes system analysis, problem identification, and interventions aimed at achieving desired outcomes for the future of eco-agriculture. However, this study does have its limitations, notably the omission of Vensim model analysis, which requires quantitative data.

Keywords: *eco-agriculture; innovation ecosystem; maqāṣid asy-syarī'ah; qualitative analysis of dynamic system.*

1. Introduction

Extreme climate change has imposed detrimental impacts on all living beings and poses a significant threat to human health[1], such as the coronavirus pandemic[2] and

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[1] José M. Montoya and Dave Raffaelli, 'Climate Change, Biotic Interactions and Ecosystem Services', *Philosophical Transactions of the Royal Society B: Biological Sciences* 365, no. 1549 (July 2010): 2013–18, https://doi.org/10.1098/rstb.2010.0114.

[2] Carl Folke et al., 'Our Future in the Anthropocene Biosphere', *Ambio* 50, no. 4 (April 2021): 834–69, https://doi.org/10.1007/s13280-021-01544-8.

malnutrition[3], illustrating a clear cause-and-effect relationship between human activities and the natural world. As beings created by God, humans are destined to be stewards of the earth, as stated in Al-Quran Al Baqarah, verse 30. This notion should be viewed through the lens of caliphate morality,[4] where humans possess the consciousness necessary to care for the environment, which aligns with the *maqāṣid asy-syarī`ah* in Islamic ecotheology.[5] Islam assigns humans two essential roles: as servants of God (*abdun*) and as God's representatives on earth (khalifah). While Abdun focuses on serving their own needs, Khalifah is entrusted with the responsibility to make decisions that benefit others and the natural world.[6]

Currently, the world is grappling with several megatrends, including a booming global population, climate change, and challenges to sustainable livestock production [7] and agriculture. These trends exert additional pressure on an already strained global food system and agricultural practices. According to Räty et al[8], they also heighten competition in livestock and agricultural production, which can hinder rural development. Human activities, coupled with the unethical exploitation of natural resources, have altered both the climate and ecosystems, adversely impacting food supply[9] and public health.[10] Research indicates that CO_2 levels have alarmingly surpassed safe thresholds, disrupting human activities [11] inflicting irreversible harm on the environment, such as

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[3] Jessica C. Fanzo and Shauna M. Downs, 'Climate Change and Nutrition-Associated Diseases', *Nature Reviews Disease Primers* 7, no. 1 (December 2021): 90, https://doi.org/10.1038/s41572-021-00329-3.

[4] Ahmad Syahid, 'Moral Kekhalifahan Manusia dalam Al-Qur'an Menurut Teori Ecotheology Islam: Studi Tafsir Tematik', *Jurnal Perspektif* 4, no. 2 (2020): 82–106.

[5] Ahmad Erwaedy et al., 'Implementing Halal Industry Management and Environment Conservation Based on Maqashid Sharia', *AL-FALAH : Journal of Islamic Economics* 6, no. 2 (December 2021): 268, https://doi.org/10.29240/alfalah.v6i2.3504.

[6] Nur Syam, 'Religion, Climate Change, and the Role of Humans', paper presented at the International Conference on Climate Change and Local Wisdom: Living in Harmony within our Built Environment, Makassar, *Religion, Climate Change, and the Role of Humans*, Architecture Department of UIN Alauddin, 2013, http://nursyam.uinsby.ac.id/?p=3846.

[7] P.R. Shukla et al., 'Special Report on Climate Change and Land — IPCC Site', IPCC, 2019, https://www.ipcc.ch/srccl/.

[8] Niko Räty, Hanna L. Tuomisto, and Toni Ryynänen, 'On What Basis Is It Agriculture?', *Technological Forecasting and Social Change* 196 (November 2023): 122797, https://doi.org/10.1016/j.techfore.2023.122797.

[9] Victor Owino et al., 'The Impact of Climate Change on Food Systems, Diet Quality, Nutrition, and Health Outcomes: A Narrative Review', *Frontiers in Climate* 4 (2022): 1–10, https://www.frontiersin.org/articles/10.3389/fclim.2022.941842.

[10] Sanober Naheed, 'An Overview of the Influence of Climate Change on Food Security and Human Health', *Archive of Food and Nutritional Science* 7, no. 1 (January 2023): 001–011, https://doi.org/10.29328/journal.afns.1001044.

[11] Usha Satish et al., 'Is CO2 an Indoor Pollutant? Direct Effects of Low-to-Moderate CO2 Concentrations on Human Decision-Making Performance', *Environmental Health Perspectives* 120, no. 12 (December 2012): 1671–77, https://doi.org/10.1289/ehp.1104789.

the loss of ice sheets, [12] rising sea levels, and abrupt changes in ecosystems, including agrosystems.[13] As a result, the ecological response to severe climate change has raised significant concerns[14], with unusual occurrences such as flowers blooming in Antarctica.[15] Human must think critically to safeguard the earth for the future of humanity.[16]

Initiatives to mitigate the impacts of climate change include eco-friendly land cultivation, utilising agricultural waste like hay and rice husk that commonly burns and pollutes the air, and other waste combinations such as eggshells, dry leaves, and manure to make planting media for various types of soil, including the unproductive ones. Solid or liquid decomposing bacteria made of cow manure or maggots are good fertiliser for planting media. With its rich natural resources, Indonesia should foster an innovative ecosystem, enabling collaborations among relevant stakeholders, such as farmers and landowners, working farmers, rural government, academics, and soil engineers to create a symbiosis and absorb the workforce. Organic waste management has reduced waste generation to zero, and the neighbouring areas serve as the supporting infrastructure for a sustainable agribusiness network. Agriculture is unique to the economy[17], serving as a competitive sector producing market commodities that are relatively homogenous to cater to the needs of consumers aware of price and quality.[18] In other words, agriculture is an ideal industry to embody free market competition and bring profits to producers and consumers.

Sarwadadi Village, Talun District, Cirebon Regency, is a rural agrarian community. In 2014[19], it had 2,506 residents (1,332 men and 1,174 women) in 726 households, with a close-knit, traditional society. Agriculture is the main livelihood.[20] A total of 224 families are farming food crops, and 86 are growing mangoes. Some raise livestock. The village has 106 hectares of agricultural land (90 rain-fed rice fields and 16 dry land).

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[12] Susan Solomon et al., 'Irreversible Climate Change Due to Carbon Dioxide Emissions', *Proceedings of the National Academy of Sciences* 106, no. 6 (February 2009): 1704–9, https://doi.org/10.1073/pnas.0812721106.

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[14] Gian-Reto Walther et al., 'Ecological Responses to Recent Climate Change', *Nature* 416, no. 6879 (March 2002): 389–95, https://doi.org/10.1038/416389a.

[15] Geetika Singh, 'Climate Change in Antarctica Has Given Rise to Blooming Flowers', Earth.Org, 5 October 2023, https://earth.org/antarcticas-floral-awakening-how-climate-change-is-transforming-the-continents-ecosystem/.

[16] R. A. Rosenblatt, 'Ecological Change and the Future of the Human Species: Can Physicians Make a Difference?', *The Annals of Family Medicine* 3, no. 2 (March 2005): 173–76, https://doi.org/10.1370/afm.271.

[17] Rockström et al., 'Planetary Boundaries'.

[18] Maryunani Maryunani, 'Establishing Food Business of Local State-Owned Enterprises in Agriculture and Agribusiness', *Jurnal Ekonomi & Studi Pembangunan* 21, no. 2 (2020), https://doi.org/10.18196/jesp.21.2.5043.

[19] Nurcipto, *Daftar Isian Potensi Desa dan Kelurahan* (Sarwadadi, Talun, Cirebon, 2015), https://id.scribd.com/doc/288063431/Desa-Sarwadadi.

[20] BPS Kabupaten Cirebon, 'Kecamatan Talun dalam Angka', BPS Kabupaten Cirebon, 2024.

Rain-fed irrigation makes production vulnerable to drought, with low rice yields (1 ton/hectare/year). Limited land ownership and insufficient irrigation contribute to low per capita income. Few water resources hinder irrigation. Irrigation development and stronger farmer organizations are crucial for sustainable agricultural growth.

Given the complex challenges of climate change, which are closely related to environmental degradation and food security, this study explores local ecological solutions through sustainable agricultural practices that utilize organic waste. Our research seeks to fill an important gap in understanding how to optimize agricultural and livestock waste management, particularly in unproductive areas at the village level, with Sarwadadi Village as the primary case. While many previous studies have focused on technical or agronomic aspects, this project emphasizes collaborative approaches involving farmers, village governments, academics, and local communities. Previous works have not thoroughly examined collaboration as part of a sustainable innovation ecosystem. Despite these valuable contributions, most studies on eco-agriculture have narrowly addressed technical issues, paying little attention to the ethical-religious dimensions and collaborative mechanisms required for long-term sustainability. Very few attempts have been made to integrate *maqāṣid asy-syarīʿah* into system dynamics analysis to understand how eco-agriculture can both succeed and endure.

This study therefore fills that gap by offering a novel contribution. It positions Sarwadadi Village as a model where Islamic ecotheology, local wisdom, and qualitative dynamic systems converge to produce a replicable framework for food security. This research is essential not only because it provides practical solutions for reducing waste and enhancing land productivity, but also because it reinforces food security rooted in local wisdom while cultivating an agricultural model that aligns with the principles of *maqāṣid asy-syarīʿah* and the values of Islamic ecotheology.

A key question is why eco-agriculture practices based on *maqāṣid* values could be successfully implemented in Sarwadadi. Our field interviews indicate that success lies in the synergy between technical opportunities and ethical-religious foundations. The village head expressed a strong commitment to revitalizing idle lands, including *tanah bengkok*, and to maximizing the function of the *embung* (village reservoir) for future agricultural development such as floating farming, supported by the application of prebiotic-based technologies. At the same time, local religious leaders confirmed that the eco-agricultural concept resonates with Islamic teachings, particularly as elaborated by Imām al-Ghazālī in *Ihyā' ʿUlūm al-Dīn*. Al-Ghazālī emphasized humanity's role as *khalīfah fī al-arḍ* (stewards of the earth), the prohibition of wastefulness (*isrāf*), and the moral duty to protect all creatures of God. These principles correspond closely to the objectives of *maqāṣid asy-syarīʿah*, protecting religion (*ḥifẓ al-dīn*) through ethical

legitimacy, life (*ḥifẓ al-nafs*) and lineage (ḥifẓ al-nasl) through healthy and secure food, intellect (*ḥifẓ al-ʿaql*) through ecological education, and wealth (*ḥifẓ al-māl*) through productive waste management. In this way, eco-agriculture in Sarwadadi is not perceived as an external innovation, but as a living practice of *maqāṣid* values.

The second question is why these practices could be implemented sustainably. Sustainability emerges from the integration of eco-agriculture into the community's socio-ecological and spiritual fabric. Farmers experience direct benefits from converting agricultural and livestock waste into productive inputs, reducing costs and increasing yields, while also fulfilling ethical and spiritual responsibilities. The village's tradition of gotong royong ensures shared ownership and responsibility, and the endorsement of religious leaders provides enduring moral legitimacy. Consequently, sustainability in Sarwadadi is multidimensional, economic viability, ecological resilience, social solidarity, and spiritual accountability converge to support long-term continuity.

Through this approach, we aim to develop an agricultural model that is not only productive but also ethical, sustainable, and inclusive. The findings suggest that eco-agriculture practices grounded in *maqāṣid* values can be both successfully implemented and sustained, offering Sarwadadi's model as a replicable example for other rural communities facing similar challenges.

2. Methods

This study focused on Sarwadadi Village in Talun Subdistrict, Cirebon Regency, to explore the integrated values of sustainability, conservation, and *maqāṣid asy-syarī`ah* within a modern framework. Using dynamic system theory and a qualitative approach, the research examined eco-agriculture practices grounded in *maqāṣid asy-syarī`ah* values for environmental conservation (*al-bī'ah*).[21] Data were collected through interviews, group discussions, Delphi studies, and participant observations[22], Individual interviews with stakeholders aimed to identify the key issues and variables,[23] while semi-structured and group discussion provided valuable feedbacks for managing this complex system.[24] Ultimately, this study offers an evaluation of the empirical practice of qualitative dynamic systems as a means to analyse sustainable, innovative agricultural ecosystems

[21] Luis Felipe Luna-Reyes and Deborah Lines Andersen, 'Collecting and Analyzing Qualitative Data for System Dynamics: Methods and Models: Collecting and Analyzing Qualitative Data', *System Dynamics Review* 19, no. 4 (December 2003): 271–96, https://doi.org/10.1002/sdr.280.

[22] Luna-Reyes and Andersen.

[23] Thanh Mai and Carl Smith, 'Addressing the Threats to Tourism Sustainability Using Systems Thinking: A Case Study of Cat Ba Island, Vietnam', *Journal of Sustainable Tourism* 23, no. 10 (November 2015): 1504–28, https://doi.org/10.1080/09669582.2015.1045514.

[24] Luna-Reyes and Andersen, 'Collecting and Analyzing Qualitative Data for System Dynamics'.

based on *maqāṣid asy-syarī`ah* and eco-agriculture. The findings will assist both local and central governments in developing better policies to enhance food security for the local community.

Table 1. Research design: Qualitative system dynamics

Phases	Activities	Objectives
Phases One Problem Identification	**Literature Review**	a. Identify research gap and objectives from the model to obtain a holistic picture/the big picture. b. Identify key variables in the conceptual models to obtain a holistic picture of *maqāṣid asy-syarī`ah* and Eco-agriculture
Phase Two Collection & Analysis	**Interviews**	a. Collect data from farmers, breeders, and the local government of Sarwadadi Village, Talun Subdistrict, Cirebon Regency using non-probability sampling. b. Collect data from farmers, breeders, and the local government of Sarwadadi Village, Talun Subdistrict, Cirebon Regency to identify key variables relevant to *maqāṣid asy-syarī`ah* c. Conduct in-depth interviews with farmers, breeders, and the local government of Sarwadadi Village, Talun Subdistrict, Cirebon Regency to identify potential causes and effects of utilizing MOL and biomass
	Data Interpretation	a. Interpret and analyze the collected data to identify the key variables, the causes, and the contributing factors to eco-agriculture in *maqāṣid asy-syarī`ah* Maqasid Al-Syariah relevant with *fiqh al-bī'ah* b. The emerging themes are connected with relevant variables to produce meaningful theory and correlation.
	Additional Data Collection	Collect secondary data based on primary data analysis, such as the use of MOL, ec0-friendly values, minimum use of chemical fertilizer, zero fertilizer, planting time acceleration, intercropping media, benefit for farmers and the community, harvests return of investment, agroecosystem, green economy, green production, and a higher preference of zero pesticide agriculture. These data are useful to identify the main driving force behind the primary components of eco-agriculture. This objective of this step is two-pronged: to explore the potential effects of eco-friendly (SMART) in the eco-agriculture variables, and to verify the validity of primary data collected from the farmers, breeders, and the local government of Sarwadadi Village, Talun Subdistrict, Cirebon Regency.

Phases	Activities	Objectives
Phase Three Develop Causal Loop Diagram	**Designing Process Flow Model**	a. Grouping related variables to make-up subcomponents of a system b. Build influence diagrams on the process of cause-and-effect relationships of variables c. Extend the scope and boundary of a model based on the data. d. Developing a causal loop diagram for system description as a standalone method. e. Identify closed or open feedback loops, counter-intuitive (reinforcing represented by "R") or self-balancing behavior (goal seeking represented by "B") of different subcomponents of the system. Identify link and loop polarity. f. Examine the likely links that may exist among variables. Identify delays (represented by '//')

Source: author's framework, 2025

The authors develop a dynamic system diagram, the causal loop diagram (CLD), using Powersim and Vensim software by identifying key variables and their correlation. CLD is a dynamic system modelling that help in mapping the cause-effect relations among variables. The first stage is problem identification that includes defining the goal of the model to assist data collection and set the scope or limitation of the model, as well as relevant literature about the system and system thinking. The first stage results in the initial model of sustainable innovative ecosystem in the perspective of maqasid al-syariah that can be shaped and perfected further through empirical data collection on the second stage.

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The second stage conducted 12 steps of empirical data collection based on the developed loop system model. Empirical data were collected by conceptualizing the elements of the system according to the development process. This stage started with collecting data through semi-structured interviews with farmers/land owners, farm laborer, and the local government in February 2023. A questionnaire guided the interviews, focusing on

the concepts and challenges in utilizing agricultural and organic kitchen waste, fostering eco-agriculture, sustaining agribusiness, utilizing local biomass, and promoting zero chemical and pesticide agriculture.

On the third and the last stage, we reached a conceptual clarity using the causal-effect process among variables, through evaluation and validation based on a cross-examination between the actual model of qualitative dynamic system and the empirical data, and further validation using the secondary data stated that the qualitative dynamic system can be solved by a series of themes or concepts emerging from the qualitative data, connecting variables to produce robust theoretical insights in the potential relationship. The outcome of the third stage is the final model of the qualitative dynamic system (Figure 1).

A broader dynamic system model enables repeated modelling process where qualitative data is an essential but often overlooked component. For example, the qualitative dynamic system is contingent upon the validation of qualitative model described above. The main component of this model was validated according to its objectives and purposes to increase the model reliability. This study used a structured verification measure, which include analyzing the conceptual model against the existing literature of the current actual system. The output is the Causal Loop Diagram, see Figure 1 below, as a mechanism to visualize relations between variables as well as to strengthen and balance the feedback loop in a holistic system.

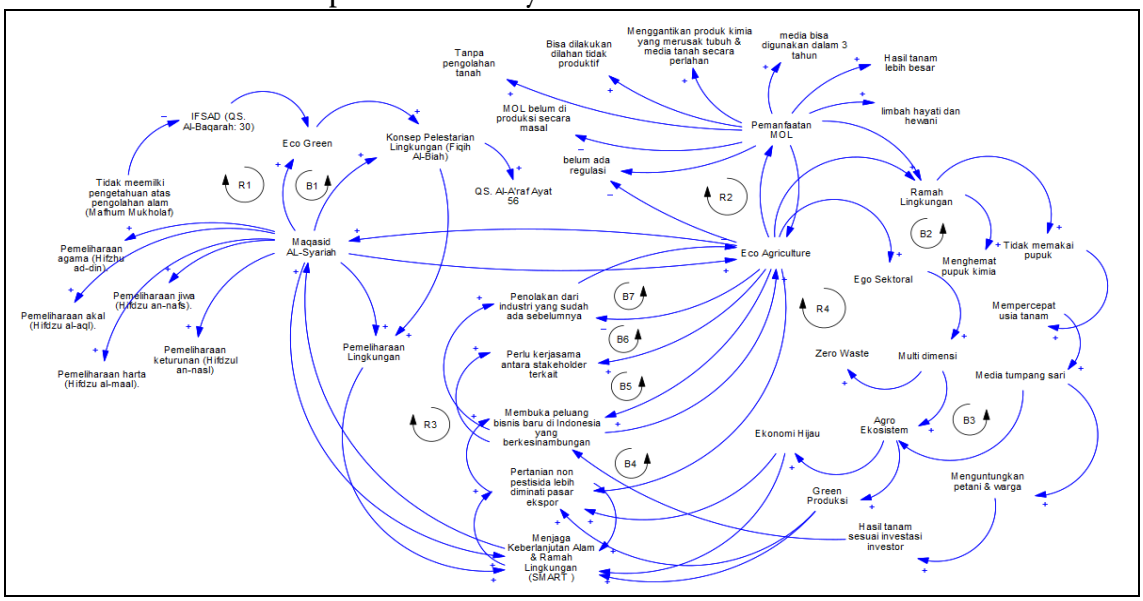

Figure 1. Qualitative System Dynamics Model of Eco-Agriculture Pivot on Maqāṣid Asy-Syarī`ah

3. Results and Discussion

A Causal-loop Diagram (Figure 1) was built based on the qualitative dynamic system formulated from the primary and secondary data. The diagram illustrates the complexity

of developing eco-agriculture oriented towards *maqāṣid asy-syarī`ah* and Islam eco-theology, which includes the potential contributing factors to eco-agriculture. The diagram consists of three groups of reinforcing loops and two groups of balancing loops, each consisting of different contributing factors to the conservation (*fiqh al-bī'ah*) in eco-agriculture that works simultaneously. Reinforcing loops play a role in reinforcing a condition or tendency in a system, while balancing loops control and stabilize a system, preventing it from deviating to extremes. The detailed description is presented in Table 2.

Table 2. Important Causal Loops for Eco-*Agriculture* pivot on *Maqasid Sharia*

Loop name	**Variables**	**Embedded themes**
Reinforcing R1	*Maqāṣid asy-syarī`ah*, Protection of Faith or Religion, Protection of Intellect, Protection of Life, Protection of Property, Protection of Lineage, Eco-agriculture, Maintaining Natural Conservation & Eco-friendly Practices (SMART)	The principles to ensure that human activities are aligned with social justice, ethical, and conservatory principles.
Balancing B1,	Eco Green, Environmental conservation (*fiqh al-bī'ah*), QS. Al-A'raf verse 56, environmental restoration, maintaining natural conservation & eco-friendly practices (SMART)	The underpinning principles of sustaining natural conservation and environment, and protecting God-given universe.
Reinforcing R2	Eco-agriculture, *maqāṣid asy-syarī`ah*, Utilization of MLO, Eco-friendly	Measures to integrate values and objectives of maqāṣid asy-syarī`ah into modern context focusing on natural conservation and sustainable farming.
Balancing B2, B3, B4, B5, B6, & B7	Eco-friendly principles, minimum use of chemical fertilizer, zero fertilizer, acceleration of planting time, intercropping media, benefits for farmers and the community, harvests return of investment, agroecosystem, green economy, green production, maintaining natural conservation & eco-friendly practices (SMART), a higher preference of zero pesticide agriculture, opening new sustainable business opportunities in Indonesia, the need for collaboration among relevant stakeholders, and resistance from existing industries.	Concepts and challenges in implementing sustainable eco-agriculture to reduce chemical fertilizer and pesticide.
Reinforcing R3	Open new sustainable business opportunities in Indonesia, the need for colla-	Meaningful steps to produce long-term benefits for the

Loop name	Variables	Embedded themes
	boration among relevant stakeholders, and resistance from existing industries.	environment, community, and economy.

Source: author's framework, 2025

1. **Loop R1.** Ensure that human activities are aligned with social justice, ethical, and conservatory principles.

Loop R1 illustrates the concept of "eco-agriculture" and "maintaining natural conservation & eco-friendly practices (SMART)." In an agricultural context, this concept aligns with natural conservation. Eco-agriculture and SMART agriculture are farming approaches that maintain environmental sustainability and mitigate negative effects of agriculture on the environment. The practice includes more efficient use of technology, wiser water spending, reducing pesticide and chemical fertiliser use, and taking measures to conserve the land and farming ecosystem. *Maqāṣid asy-syarī`ah*, eco-agriculture, and SMART agriculture are essentially the initiatives to integrate religious, ethical, and environmental values into daily practices, particularly economic and farming activities. It encompasses the following principles.

1) Protection of Social Justice, Ethical Integrity, and Environmental Sustainability
   This principle advocates that human activities abide with social justice, ethics, and environmental sustainability principles, and translate these values to aligning the decision and attitude of individuals, organizations, or community to a broader purpose of promoting fairness, moral responsibility and ecological balance. These may include, among others, economic principles, resources management, governance, and community development.
   a. Social Justice
      Social justice ensures that all resources, opportunities, and rights are distributed equitably across the community, bridging the gaps in race, gender, socio-economic status, and other factors. Promoting equality and inclusivity means advocating policies that empower marginalised communities. These may include implementing policies that provide equal access to education, healthcare, jobs, and general rights, as well as reducing systemic inequality.
   b. Ethical Responsibility
      Ethics involves the moral principles that govern our understanding of right and wrong. Upholding ethical conduct means advocating for honesty, integrity, respect, and accountability in decision-making. These values can manifest in practices such as fair workforce policies, sustainable environmental initiatives, and financial transparency, even if it means sacrificing short-term gains.
   c. Environmental conservation

This principle emphasises the value of safeguarding ecosystems and biodiversity while ensuring the sustainability of natural resources for future generations. It calls for efforts to reduce pollution, combat climate change, and encourage the responsible use of renewable energy. For instance, transitioning to renewable energy sources like solar or wind power can help lessen reliance on fossil fuels and decrease carbon emissions.

2) Eco-friendly Agriculture and SMART Farming for Sustainable Agriculture.

Eco-friendly agriculture and SMART farming prioritise sustainable cultivation methods, employing technology and efficient strategies to minimise environmental impacts while maximising production.

Eco-friendly farming promotes the following practices:

a. Organic farming with zero pesticides and synthetic fertilizer to maintain soil health.
b. Plant rotation and diversification to maintain soil fertility and biodiversity, minimizing risks of pests and diseases.
c. Water conservation technique, such as drip irrigation or rainwater harvesting rainwater, to minimise water waste.
d. Agroforestry systems that incorporate trees into agricultural landscapes, enhancing soil quality, increasing biodiversity, and sequestering carbon.

The SMART agriculture innovation implemented in Sarwadadi Village includes the following:

a. Sensors and IoT technology for monitoring soil moisture, temperature, and nutrients, ensuring efficient resource allocation.
b. GPS-tracked machinery and drones for precise planting, spraying, and harvesting, which help reduce fuel usage and chemical runoff.
c. A digital farming platform for data-driven decision-making to optimise resource use, reduce waste, and enhance yields.

Aligning human activities with social justice, ethics, and sustainable environmental practices necessitates a comprehensive approach that balances economic, social, and environmental priorities. By integrating these practices into agriculture, we can foster sustainable food production that benefits both the community and the natural world.

2. Loop B1. The importance of natural and environmental sustainability and the conservation of the universe God created.

Natural and environmental sustainability, along with the conservation of the universe created by God, holds paramount significance. Islamic teachings emphasise that nature conservation and a sustainable environment are vital components of faith, deeply rooted in *fiqh al-bī'ah* (the laws concerning nature). Numerous verses from the

Quran stress humanity's responsibility towards the environment, underscoring the importance of preserving sustainability and protecting the universe.

These principles highlight the importance of preserving environmental sustainability and protecting the universe God created, demonstrating a deep Islamic understanding of the nature purity and human's role as the earth's guardian. This concept is underpinned in Islamic teaching, encompassing a holistic view of environmental conservation and sustainability.

According to Islamic belief, conservation of nature is a fundamental tenet that includes the principles of stewardship (*khilāfah*) and trust (Amanah) concerning the earth. Muslims are entrusted with the duty to safeguard the environment and conserve natural resources for future generations. The concept of guardianship (Amanah) suggests that God has tasked humanity with the responsibility of protecting and preserving all natural elements, including soil, water, air, and biodiversity.

The foundation of Islamic jurisprudence (*fiqh al-bī'ah*) offers an ethical framework governing human interaction with the environment, focusing on sustainable practices and conservation efforts. *Fiqh al-bī'ah* encompasses regulations related to land use, water management, fishing, waste disposal, and natural conservation, all aimed at ensuring ecological balance and the well-being of living beings.

The Quran, the sacred text of Islam, includes verses that emphasise the importance of purity and our role as stewards of the earth. These passages offer moral and spiritual guidance on how to engage with nature in a sustainable and respectful way. For instance, Surah Al-An'am (6:141) advises, "Eat of the fruit they bear and pay the dues at harvest, but do not waste. Surely He does not like the wasteful." Similarly, Surah Ar-Rum (30:41) warns, "Corruption has spread on land and sea as a result of what people's hands have done, so that Allah may cause them to taste the consequences of some of their deeds, and perhaps they might return to the right path."

Overall, Islamic teachings deeply embed the principles of conservation and protection of the natural world, as created by God. Muslims are encouraged to adhere to ethical and sustainable practices when interacting with the environment, guided by the verses of the Al-Quran and the principles of Islamic jurisprudence. By following these guidelines, Muslims can fulfil their religious obligation to manage and support the conservation and welfare of the earth and all living beings.

3. **Loop R2**. Measures to integrate values and objectives of *maqāṣid asy-syarī`ah* into modern context focusing on natural conservation and sustainable farming

Loop R2 illustrates how eco-agriculture represents a sustainable and environmentally friendly farming approach that aligns with the principles of Maqasid Al-Syariah,

especially in terms of protecting nature (*Hifz al-bī'ah*) and property (*ḥifẓ al-māl*). These principles advocate for agricultural practices that mitigate environmental harm, such as using Liquid Organic Media (MOL) as a more eco-friendly alternative to synthetic chemicals. The eco-friendly aspects of agriculture, such as maintaining the natural state of ecosystems, minimising waste, and promoting sustainable farming, reflect Islamic values that prioritise nature conservation and safeguarding property for social welfare and ecological balance.

Efforts to integrate the values and objectives of *maqāṣid asy-syarī`ah* into contemporary practices centred on nature conservation and sustainable agriculture provide a holistic approach to apply Islamic values in addressing modern challenges. *Maqāṣid asy-syarī`ah* refers to the higher aims and principles that foster social welfare and justice while preserving essential values. When applied to nature conservation and sustainable farming, these principles create a framework for promoting practices that align with ecological sustainability and long-term balance.

The principle of nature conservation (*hifz al-bī'ah*) within *maqāṣid asy-syarī`ah* highlights the significance of protecting natural resources for the greater good, safeguarding existing life and ensuring future welfare. Integration efforts may involve initiatives that promote nature conservation, sustainable resource management, and ecosystem restoration. This could translate into eco-friendly farming practices like agroforestry and permaculture, which prioritise biodiversity and soil health while fostering sustainable food production. This approach aims to recreate natural ecosystems, enhancing resilience to environmental stress and mitigating the impacts of climate change.

The principle of protecting property (hifz al-mal) within *maqāṣid asy-syarī`ah* highlights the importance of responsibly managing wealth and resources, such as farming assets and land. In contemporary agriculture, this protection involves promoting sustainable practices that optimise resource use, reduce waste, and ensure a fair distribution of benefits. This study has found that organic farming using liquid organic media (MOL) is an environmentally friendly method that aligns with the principles of *ḥifẓ al-māl*. By minimising reliance on synthetic chemicals and utilising natural agents, organic farming enhances soil fertility, reduces chemical pollution, and preserves farm resources for future generations.

Incorporating *maqāṣid asy-syarī`ah* into modern farming necessitates the promotion of sustainable practices that reflect Islamic values. This includes initiatives aimed at reducing water consumption, enhancing soil fertility, and addressing environmental challenges while safeguarding food security and farmers' livelihoods. Specifically, the adoption of water-efficient irrigation methods, such as drip irrigation and rainwater

harvesting, can help conserve water resources and alleviate water scarcity, ultimately improving agricultural productivity. Additionally, embracing agroecological practices, like crop rotation and integrated pest management, can bolster sustainable farming efforts, increase resilience to climate change, and decrease reliance on external inputs.

Integrating the values and objectives of *maqāṣid asy-syarī`ah*into nature conservation and sustainable agriculture offers a comprehensive strategy to tackle contemporary challenges while staying true to Islamic principles. Encourage farming practices that prioritise environmental conservation, biodiversity, and sustainability, which will contribute to both social and environmental well-being.

4. **Loop B2, B3, B4, B5, B6, & B7.** Concepts and challenges in implementing sustainable eco-agriculture to reduce chemical fertilizer and pesticide.

The interactions represented in Loop B2, B3, B4, B5, B6, and B7 illustrate how these variables have created a strategic and SMART (Sustainable, Measurable, Achievable, Relevant, and Time-bound) approach to developing sustainable farming in Indonesia. Implementing eco-friendly practices and reducing chemical fertilisers can accelerate planting times, facilitate intercropping, and produce profitable harvests for farmers and local communities. Achieving harvest yields that provide a satisfactory return on investment will support a green economy and promote pesticide-free farming, creating new business opportunities. At the time of this research undertaking, Sarwadadi Villages did not have any existing collaboration with other stakeholders to improve its agricultural practices.

5. **Loop R3.** Meaningful steps to produce long-term benefits for the environment, community, and economy.

Loop R3 demonstrates that creating opportunities for sustainable, new eco-agriculture businesses in Indonesia requires solid collaborations with multiple stakeholders, from the government to farmers and environmental organisations. However, the existing conventional farming industry tends to resist this initiative, fearing the changes and challenges brought upon their long-established business. To mitigate their resistance, it takes an educational campaign, supporting policies, and tangible outcomes in the economy and environment after implementing eco-agriculture. We expect these measures to increase awareness about the long-term profit and benefits of eco-agriculture.

Farmers and the community in Sarwadadi Village, Talun District, Cirebon Regency, have embraced the spirit of sustainability and nature conservation, integrating *maqāṣid asy-syarī`ah* values into a modern context. Eco-agriculture in the village is not merely a business but an ethical call to preserve the nature (*Hifz al-Biah*) and protect their

property (*ḥifẓ al-māl*). They are committed to minimising pesticide and chemical fertiliser for their farming and switching to the more eco-friendly liquid organic media (MOL). A strong collaboration was established between farming labourers, rural government, academics, and agriculture experts. Initially, the conventional farming industry were uncertain of eco-agriculture's success, but the real evidence of improved productivity, environmental quality, and tangible benefits to the local community changed their minds. Accordingly, initiatives to integrate *maqāṣid asy-syarī`ah* values and objectives into modern life in Sarwadadi Village have come to fruition, creating sustainable farming integrated with ecological ethics as an integral, inseparable part of the community.

However, further field findings indicate that collaboration remains weak due to the limited natural resources available in each region. The absence of a Memorandum of Understanding (MoU) between regions hinders the production of growing media if it is carried out continuously. It underlines the importance of the government bridging the gap with strong regulations as a legal framework both at the central and regional levels. To improve literacy and education for all stakeholders, the association can hold weekly evaluation meetings. Focusing on one commodity can accelerate the development of an innovative ecosystem.

Figure 2. Making planting media in sacks

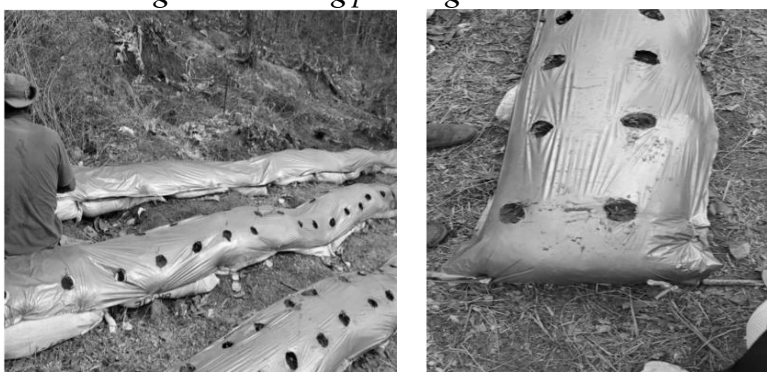

Figure 3. Planting non-rice crops in planting sacks

Figure 4. The direct application of growing media into agricultural fields

4. Conclusion

Incorporating *maqāṣid asy-syarī`ah* into modern agriculture can be achieved through collaborative measures adjustable to the existing resources in each village in Cirebon Regency. This study has demonstrated that Sarwadadi Village in Talun, Cirebon can serve as a role model of effective, eco-friendly agriculture with compliance with *maqāṣid asy-syarī`ah* values. It promotes sustainable agriculture by combining agricultural waste with other materials for further utilization. The qualitative dynamic system is a suitable method to create a model of sustainable agriculture, providing a well-structured work process that enables food security without dependency on climate or weather conditions. Importantly, this study shows that eco-agriculture in Sarwadadi could be successfully implemented because the values of *maqāṣid asy-syarīʿah* resonate with local wisdom, religious legitimacy, and collective practices such as gotong royong. Its sustainability is ensured by tangible economic benefits, ecological resilience, and spiritual accountability, which together foster strong community ownership and long-term commitment. This research focused on a qualitative method, thus limiting further exploration of farmers' conditions and decision-making modeling. Future studies may adopt quantitative approaches, including Vensim-based analysis, to obtain more robust and generalizable data.

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