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Ecological Dimensions of Abbasid Civilization and Their Relevance to Islamic Education

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Today's global ecological crisis reflects the imbalance in human and environmental relations in the epistemological, pedagogical, and historical dimensions, thus demanding a re-reflection on the treasures of Islamic civilization, especially the ecological experience of the Abbasid period, as the basis for the development of ecologically-oriented Islamic education. This research aims to explore the ecological dimension of the Abbasid era as a strategic direction of Islamic education. The research uses a qualitative approach based on literature studies with historical-critical, normative-philosophical, and conceptual analysis of classical literature as well as contemporary scientific studies related to Islam and ecology to identify the principles, practices, and frameworks of ecological thought at that time. The results of the study show that Abbasid ecological practices are based on the principles of tawhid that are actualized in urban planning, irrigation systems and dams, public sanitation, conservation of areas (ḥimā), and concern for animal welfare. These practices reflect the integration of revelation, scientific rationality, and social responsibility as the foundation of a sustainable civilization. In practical terms, these findings have implications for the importance of integrating historical-ecological perspectives into Islamic education policies in order to build sustainability awareness that is responsive to global challenges.

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Public Interest Statement

The global ecological crisis demands a renewal of the Islamic education paradigm to be more responsive to sustainability issues. Although many studies have addressed environmental ethics in Islam, few have reconstructed the ecological experience of Islamic history, especially the Abbasid period, as the conceptual basis of contemporary education. This research fills this gap by placing Abbasid ecological practices as lessons learned for the development of Islamic education with an ecological dimension. These findings are important for academics and education practitioners because they offer an integration between historical heritage, theological value, and sustainable curriculum design that is relevant to today's global ecological challenges.

Introduction

Visibly, today's global ecological crisis shows an imbalance in the relationship between humans and the environment (Weintrobe & Zeavin, 2025). Reports from various international agencies show a consistent increase in the earth's average temperature in recent decades, accompanied by extreme weather intensity, droughts, floods, and increasingly frequent wildfires (Pordeus et al., 2025). Global temperature rise has had an impact on melting polar ice, rising sea levels, and the disruption of coastal ecosystems and small islands.

Table 1. Empirical Data on the Global Warming Crisis

No	Aspects	Description	Quantitative	Source
1	Global Warming	Increase in average temperature of the atmosphere, sea, and land (CO_2, CH_4, N_2O).	Global temperatures have increased ± 1.1°C compared to pre-industrial times.	Intergovernmental Panel on Climate Change (Calvin et al., 2023)
2	CO_2 Concentration	Atmospheric CO_2 concentrations reached their highest level in the last ±2 million years.	Record highest in modern geological history.	Global Carbon Project, 2023
3	Sea Level Rise	Polar ice melting and thermal expansion of seawater.	Rising by about 21–24 cm since 1880; one-third occurred in the last 20 years.	National Oceanic and Atmospheric Administration (NOAA)
4	**Deforestation**	**Deforestation accelerates CO_2 accumulation.**	**Loss of millions of hectares of tropical forests every year.**	**Global Forest Watch**

The data in the table 1. shows that global warming is really happening and is increasing. According to the Intergovernmental Panel on Climate Change, the average temperature of the earth has risen by about 1.1°C compared to the pre-industrial period of CO_2, CH_4, and N_2O from human activities (Calvin et al., 2023). NASA also notes that 2023 will be the hottest year in modern history (NASA Analysis Confirms 2023 as Warmest Year on Record - NASA, 2026), while the Friedlingstein et al. (2023) mentions that current CO_2 levels are the highest in about two million years (Rovere et al., 2023). The impact can be seen in sea level rise of about 21–24 cm since 1880 according to the National Oceanic and Atmospheric Administration (NOAA), as well as the loss of millions of hectares of tropical forests every year based on Global Forest Watch data (*BMKG | Stasiun Pemantau Atmosfer Global (SPAG) Lore Lindu Bariri - Pemanasan Global*, n.d.). In simple terms, this data confirms that global warming is a real crisis caused by human activities and has a direct impact on the earth's system. In the national and local contexts, various large cities face the problem of air pollution that is above the safe threshold. Motor vehicle emissions, industrial activities, and the burning of fossil fuels are the main contributors. The impact is not only on the environment, but also on public health, including the increase in cases of respiratory diseases.

The exploitation of natural resources, environmental degradation, and weak ecological awareness are multidimensional problems that underlie the crisis mentioned above (Abdulsalam et al., 2025). This is not only technical, but also historical and pedagogical. In this context, Islamic education faces a serious challenge to reformulate its epistemological orientation in order to be able to respond to environmental problems integrally. Historically, Islamic civilization during the Abbasid period was known as the era of scientific advancement, urban planning, irrigation systems, agriculture, water management, and the development of intellectual institutions such as Bayt al-Hikmah (Bhattarai & Yousef, 2025). However, contemporary studies have focused more on political (White et al., 2025), military, scientific, and philosophical aspects, while ecological dimensions such as water management, land conservation, and environmental ethics in *fiqh* have not been comprehensively explored as a source of historical learning (A. Alamri et al., 2025). Recent conditions show an epistemological fragmentation in the Islamic education curriculum, where Islamic sciences are often separated from ecological issues that are considered to be in the domain of modern science (Romdlony et al., 2025). This dichotomy narrows the scope of Islamic education and reduces its capacity to respond to environmental crises as a moral and spiritual responsibility. On the other hand, there is a view that environmental problems are adequately addressed through technological approaches and public policies without the need to reconstruct the educational paradigm based on Islamic traditions (Zainuddin et al., 2025). This debate shows the divergence of approaches between the technocratic model and the value-based integrative model.

Based on this background, this research aims to re-explore ecological practices and paradigms in the Abbasid socio-intellectual context as the basis for the development of an environmentally sound and sustainability-oriented Islamic education paradigm. The significance of this research lies in the effort to bridge the epistemological continuity between the legacy of classical Islamic civilization and the needs of contemporary education, while showing that the integration between religious and natural sciences is a relevant historical foundation to answer the challenges of the current ecological crisis. In general, this study argues that the revitalization of historical readings of Islamic intellectual traditions can make a conceptual contribution to the formation of a more integrative, ethical, and sustainable paradigm of Islamic education.

Literature Review

Studies on Islam and ecology show significant developments, but are still fragmented in two main orientations that are not yet fully integrated. The first orientation places environmental ethics as a normative construct rooted in the doctrines of Islamic theology. In this perspective, the concept of *mīzān* (balance) and the prohibition of *fasād* (damage) are the normative foundations that affirm that environmental preservation is part of the moral and spiritual obligations of Muslimsare that provide moral legitimacy to human responsibility in maintaining the balance of nature (Nur et al., 2025). This approach succeeds in strengthening the philosophical and normative dimensions of Islamic environmental ethics, but tends to stop at the formulation of values so that it is not able to explain how these principles are institutionalized in social and educational practice. In response to these limitations, the second orientation shifts attention from the normative aspect to the historical reality of Islamic civilization. Allahham et al. show that ecological values are not only present as moral teachings, but have been embodied in social institutions (Allahham, 2025b). These findings expand the understanding that Islamic environmental ethics has a pragmatic dimension that has been tested in historical experience. However, the research focuses more on institutional and environmental governance aspects, without explaining how these historical experiences are transformed into educational paradigms that are able to shape ecological awareness across generations.

The debate then developed into the philosophical and implementive realms. Seyyed Hossein Naṣr places the modern ecological crisis as a consequence of the desacralization of nature due to the separation of science from spirituality. This perspective provides a strong metaphysical framework for the development of Islamic ecology (Naṣr, 1976), but does not yet offer an operational educational model. In contrast, Shabanov et al. and Ramli developed a more applicative approach through the integration of sharia principles in environmental governance and the internalization of ecological values in religious education (Ramli, 2026; Shabanov et al., 2025). Although they succeeded in presenting a more concrete implementation strategy, the two studies tended to depart from contemporary needs so that the reconstruction of the concept of education was less based on the historical experience of Islamic civilization.

Table 2. Matrix of previous research literature

Author	Focus	Limitation	Gap Addressed by This Article
Nur, A., Bin Husin, H., Alwizar, & Yasir, M (2025)	The theological foundation of Islamic environmental ethics through the concepts *mīzān* and *fasād*.	It stops at normative legitimacy and has not linked it to the reconstruction of Islamic education.	Connecting Islamic theological principles with an ecologically-oriented Islamic education paradigm.
Allahham. (2025)	Decentralized environmental decision-making mechanisms, as well as power relations, are not just static physical forms or religious identities.	It is descriptive-historical and does not yet offer pedagogical analysis.	Bridging historical research on Abbasid environmental governance with Islamic education by reconstructing documented ecological practices as contextual learning resources for developing ecological awareness in contemporary Islamic education.
Seyyed Hossein Naṣr (1976)	Man and Nature: The Spiritual Crisis of Modern Man	It offers a philosophical foundation, but has not yet produced an implementable educational model.	Integrating philosophical perspectives with the pedagogical design of ecological Islamic education.
Shabanov et al. (2025)	Islamic environmental ethics, sharia, and sustainability governance.	Focus on sustainable policies and development, not the paradigm of Islamic education.	Shifting the focus to the reconstruction of the educational paradigm based on the heritage of Islamic civilization.
Ramli (2026)	**Internalizing environmental values in religious education in Indonesia.**	**Not utilizing the historical experience of Islamic civilization as a conceptual foundation.**	**Making the ecological experience of the Abbasid Era the foundation for the development of ecological Islamic education.**

Based on table 2, it can be seen that there is fragmentation in the study of Islam and ecology. Theological studies emphasize normative legitimacy, historical studies focus on the reconstruction of civilizational practices, philosophical studies develop criticism of modernity, while applied studies focus more on sustainable development and environmental education. To date, there has been no research that integrates these four dimensions into a single conceptual framework that specifically reconstructs the paradigm of Islamic education based on the ecological heritage of Islamic civilization. Departing from these gaps, this article takes a different position by placing the ecological experience of the Abbasid Era as a meeting point between theological, historical, philosophical, and pedagogical dimensions. In contrast to previous research that tends to examine each dimension separately, this study reconstructs the ecological practices of the Abbasid Era as a conceptual foundation for the development of

ecologically oriented Islamic education. Thus, the main contribution of this article is to offer an ecologically-oriented Islamic educational model that integrates the principles of Islamic cosmology, environmental management practices during the Abbasid Dynasty, and transformative pedagogical approaches. This model includes six main components, namely: (1) learning outcomes that foster ecological awareness and responsibility as caliphs fi al-ardh; (2) curriculum themes that integrate Islamic values with environmental issues; (3) project-based learning methods, problem-solving, and field experience; (4) assessments that measure knowledge, attitudes, and practices of environmental concern; (5) institutional policies that support the culture of schools, Islamic boarding schools, or green campuses; and (6) implementation through eco-madrasah programs and green pesantren.

Materials and Methods

This research uses a qualitative approach with library research design combined with historical-critical analysis and conceptual reflection. This approach was chosen because the research aims to trace the construction of ecological thoughts, values, and practices during the Abbasid Dynasty through historical evidence, then reflect it conceptually as the foundation for the development of contemporary Islamic education (Westberg, 2025). In contrast to literature studies that only rely on the synthesis of secondary literature, this study places the original historical manuscript as the main data source so that it is in accordance with the character of historical research. Data collection is carried out through systematic tracing of primary sources and secondary sources (Chand, 2025). Primary sources are manuscripts and classical works that date from the Abbasid period or have a historical affinity to that period, such *as* Al-Baghdādī'*Tārīkh Baghdād*, al-Yaʿqūbī's *Tārīḫ*, al-Muqaddasī's *Aḥsan al-Taqāsīm fī Ma'rifat al-Aqālīm*, Al-Masʿūdī's *Murūj al-Dhahab wa Maʿādin al-Jawhar,* Yāqūt al-Ḥamawī's *Muʿjam al-Buldān*, as well as other manuscripts containing information on environmental management, irrigation systems, agriculture, urban planning, and public policy during the Abbasid period. Manuscripts are obtained through digital repositories, such as Al-Maktaba al-Shamela, Qatar Digital Library, Internet Archive, as well as the digital collections of university libraries, while secondary sources are obtained from international scientific databases, namely Scopus**,** Web of Science**,** JSTOR, SpringerLink, ScienceDirect, Google Scholar, and the Directory of Open Access Journals (DOAJ) as materials for historical verification, interpretation reinforcement, and conceptual analysis development.

Source search was carried out using a combination of keywords in English and Arabic, including Abbasid ecology, Islamic environmental ethics, Islamic ecological thought, Islamic education and sustainability, ḥimā system, water management in Islam, Islamic urban planning, historical ecology in Islam, as well as Arabic equivalents such as *al-Ḥimā, al-Kharāj, al-Bī'ah, al-Miyāh, al-Zirā'ah,* and *al-Khilāfah al-'Abbāsiyyah*. The inclusion criteria include primary manuscripts that date from the Abbasid period or directly address the social, political, economic, and environmental conditions of that period, as well as scholarly publications that examine the history of Islamic ecology, Islamic education, or environmental thought from an Islamic perspective. On the other hand, sources that have unclear origins, inadequate academic authority, are duplicate data, or have no direct relevance to the focus of the research are excluded from the analysis. The historical period studied in this study is the Abbasid period, which covers 132–656 AH / 750–1258 AD. This chronological range refers to the historical period that is the object of the study. Primary sources consist of classical Arabic-language historical and intellectual works produced during the Abbasid period or that contain records of society, government, economy, and environmental practices during the Abbasid period. Therefore, the selection of primary sources is not limited exclusively to manuscripts or works dating from the 13th century, but is based on their relevance and evidential value in reconstructing the Abbasid period. Historical works from later periods and modern editions are used only when they preserve, transmit, or critically document evidence relating to the Abbasid period, with the date of their compilation or publication clearly distinguished from the historical period discussed. Secondary sources mainly consist of scholarly publications published between 2000 and 2026 to capture the latest developments in relevant studies. Earlier authoritative studies, however, are still used as exceptions when they provide theoretical or historical interpretations that are fundamental and still directly relevant to the analysis.

Data analysis was carried out through a historical-critical analysis approach by examining the content of the manuscript, the meaning of terminology, historical narrative, and the relationship between ecological practices and the socio-political context in the Abbasid period (Freeman, 2025). Source identification is done by noting the work, the part of the text analyzed, the edition used, and the basis for its selection. The primary sources analyzed include al-Baghdādī, *Tārīkh Baghdād;* al-Yaʿqūbī, *Tārīkh*; al-Muqaddasī, *Aḥsan al-Taqāsīm fī Maʿrifat al-Aqālīm*; al-Masʿūdī, *Murūj al-Dhahab wa Maʿādin al-Jawhar*; and Yāqūt al-Ḥamawī, *Muʿjam al-Buldān*. The analyzed sections were selected based on information related to urban infrastructure, water management, parks, agriculture, natural resources, as well as environmental management practices relevant to people's lives in the period studied. The analysis used published editions that were accessible to researchers. The selection of sources was based on the relevance of the content, the proximity of the work to the historical context studied, its textual authority, and its ability to provide information that can be compared with other sources.

Historical triangulation is done by comparing the same or related information from multiple sources. For example, the descriptions of urban infrastructure, water use, parks, and urban spatial management in *Tārīkh Baghdād* are compared with those of al-Yaʿqūbī, al-Muqaddasī, al-Masʿūdī, and Yāqūt al-Ḥamawī. The suitability of information between sources is used as a basis for reinforcing interpretation. Differences in terminology, emphasis, chronology, or description are not omitted, but are noted as part of the variation in historical testimony. When information

appears in more modern sources, it is used carefully to trace the transmission and possible reinforcement of information, rather than directly treated as evidence that the practice took place in an earlier period. Thus, the interpretation is based on comparisons between sources and takes into account the chronological context of each record. After the stage of identification and triangulation of sources, the research uses a normative-philosophical approach to analyze theological values that can be linked to practices that have been supported by textual evidence, especially the concepts *of al-Tawḥīd*, *al-Khilāfah*, *al-Amānah*, *al-Mīzān*, and *al-Iṣlāḥ*, as well as human responsibility to the environment. This stage is distinguished from the identification of historical facts so that normative concepts are not used to prove the existence of a practice that is not supported by historical sources. In the final stage, *conceptual reflection* is used to reconstruct historical findings that have gone through a process of comparison and interpretation into a conceptual framework of Islamic education that is oriented towards ecological awareness. Synthesis is carried out inducively by extracting principles supported by historical findings, then contextualizing them in the development of Islamic education. This can be clearly seen in Table 3 below.

Table 3. Research Methodology Framework

Components	Description
Types of Research	Qualitative research with a library research design.
Approach	Historical-Critical Analysis, Normative-Philosophical Analysis, and Conceptual Reflection.
Primary Sources	Classical Abbasid manuscripts, including al-Baghdādī's Tārīkh Baghdād, al-Yaʿqūbī's Tārīkh, al-Muqaddasī's Aḥsan al-Taqāsīm fī Maʿrifat al-Aqālīm, al-Masʿūdī's Murūj al-Dhahab wa Maʿādin al-Jawhar, and Yāqūt al-Ḥamawī's *Muʿjam al-Buldān*.
Secondary Sources	Peer-reviewed scholarly articles indexed in Scopus and Web of Science, as well as relevant publications from JSTOR, SpringerLink, ScienceDirect, Google Scholar, and DOAJ, supplemented by relevant scientific books.
Manuscript Repositories	Al-Maktaba al-Shamela, Internet Archive, and other relevant digital library collections.
Search Terms	Abbasid ecology, Islamic environmental ethics, Islamic education, ḥimā, water management, and their Arabic equivalents.
Inclusion Criteria	Scholarly and historical sources directly relevant to Abbasid ecology, Islamic environmental ethics, Islamic education, ḥimā, water management, and related historical or conceptual themes
Exclusion Criteria	Popular articles, unauthoritative sources, sources lacking adequate historical evidence, duplicate records, and materials unrelated to Abbasid ecology, Islamic environmental ethics, Islamic education, ḥimā, water management, or the research objectives.
Chronological Range	Primary sources produced during or discussing the Abbasid period (132–656 AH / 750–1258 CE), supplemented by contemporary scholarly analyses where relevant.
Language	Arabic and English.
Analysis and Synthesis Procedure	**Historical Criticism, Normative-Philosophical Analysis, Conceptual Reflection, and Historical Triangulation.**

Result and Discussion

Islamic Ecological Thought in the Abbasid Period

The earth that is inhabited and used as a place of activity by humans does not belong to them absolutely, but belongs to its true Owner, namely Allah SWT., who created the universe and life. God established laws, rules, and boundaries for life on earth; Obeying it and not exceeding these limits is an obligation for every human being who wants salvation for himself, society, and the earth and its contents. Among these restrictions is the prohibition of doing damage and destruction on earth. Whoever disregards this principle and acts unjustly and excessively ultimately brings ruin upon himself.

Issues of nature have been a concern of Islam since more than 1400 years ago, occupying an important place in the teachings of the Qur'an and the Sunnah of the Prophet, making them worthy of being called the "environmental constitution of Islam" (Muhamad et al., 2020). One of the main characteristics of Islam as a religion is its comprehensive view of existence, life, and man (Kasa, 2025). This view influences all moral orientations and principles of Islamic legislation, explaining various aspects of human life, revealing the nature of diverse existences, and answering fundamental questions about the meaning and purpose of human existence. Within this framework, Islam formulates its attitude towards the earth's resources and environmental components and regulates various forms of human relations with them. In summary, this view implies that Allah SWT. is the Creator of the universe and all its contents; It is He who creates, shapes, and possesses them, and has complete control over them. He regulates, turns on and off, maintains and terminates, recompenses and sets terms according to His will. Therefore, humans are obliged to obey the rules that have been set by Allah in regulating their interaction with nature in all its forms and dimensions.

The majority of *mufassir* affirm that humans do not in essence have absolute ownership over anything on earth. al-Ṭabarī views in QS. al-Kahf [18]:82, that human beings are only representatives or trustees, because all property is essentially the property of Allah whom He created and created (Muḥammad ibn Jarīr al-Ṭabarī, 2001, pp. 88–91). Humans are only given the authority to use it, not as the true owners. Al-Qurthubi in his commentary on the above verse, encouraged people to fulfill their rights to the property before it was transferred to someone else (Al-Qurṭubī, 2003, p. 38). Ibn Kathīr in his interpretation of QS. al-Kahf [18]:82 views the property as a trust that was previously in the hands of the previous generation, then passed on to the next generation to be used in the context of obedience to Allah (Ibn Kathīr, 2011, p. 187). If it is not used according to the provisions, then humans will be held accountable and sanctioned for the negligence. Al-Alusi also affirms the same meaning, that what is in man's hands is essentially Allah's, and man is only a representative who is commanded to channel it according to His will, so that he is not bound by the desire to accumulate and dominate it excessively (Al-Ālūsī, 1994).

Etymologically and terminologically, in a broader scope, the environment encompasses cosmic elements such as the earth, sky, water, and air, as well as encompassing the relationship between the natural world (*al-'ālam al-kawnī*) and the living world (Asif, 2025). It includes water resources, soil, rocks, living organisms, as well as all aspects related to purity, feasibility, damage, pollution, and sustainability. The environment also includes biological dimensions such as reproduction and inheritance, as well as the mutual relationship of humans with other living things. Therefore, the environment is not just a collection of physical objects, but a dynamic relational network. Historically, the term al-bī'ah has been used by Muslim scholars since the third century Hijri, including Ibn 'Abd Rabbih in *al-'Aqd al-Farīd*, who interprets it as a natural as well as a human social environment. This understanding shows that the Islamic intellectual tradition has long integrated geographical, biological, political, intellectual, and ethical dimensions in understanding the environment. This means that the environment in the Islamic perspective is never reduced to a mere physical entity, but is understood as a space of civilization. Even the environment is also understood as the natural world in Aristotelian terms referred to as the realm of occurrence and corruption (*'ālam al-kawn wa al-fasād*). In a political-philosophical sense, the environment also includes the concept of homeland (*waṭan*), which is the identity space where humans are born, grow, and build emotional attachments (Abou-Tabickh, 2019). However, modern consciousness expands that meaning to include planet earth as the "great homeland" of humanity.

In this context, man and earth are part of one system of inseparable cosmic unity. Ontologically in the perspective of the heavenly religions, man was created from the ground, which shows that he is an integral part of nature, not an entity that stands outside of it. Even in Islamic philosophy, human beings are seen as part of the cosmic order, even though they have rational superiority. Even biologically, the human body is composed of the same chemical elements as the earth elements carbon, iron, phosphorus, calcium, and so on, so that the relationship between humans and the environment is not a dualistic relationship, but a unity of origins. In the perspective of Islamic theology, nature serves as a kauniyah verse of signs of God's existence. The *mutakallimun* use the argument *hudūth al-'ālam* (the novelty of nature) to affirm the existence of a Creator, while philosophers such as al-Farabi and Ibn Sina use the argument of *imkān al-wujūd* (contingency) to arrive at the concept of *Wājib al-Wujūd*. Ibn Rushd and other theologians developed *dalīl al-'ināyah* (the argument for order and purpose), which viewed ecological harmony as evidence of the existence of a divine designer. Even the beauty of nature, according to al-Tawhidi, is an aesthetic manifestation of the abundance of God's perfection.

The concept of similarity (analogy) between beings is also found in Neoplatonism, the Arabic philosophy of illumination (*isyraqi*), the Gnostic tradition, and Islamic Sufism. This theory states that there is a gradual connection between the basic elements of nature until it reaches humans. This idea is widespread in Islamic thought. Al-Farabi, for example, arranges a hierarchy of forms in the material world (i.e., this environment), in which man is part of nature under the sphere of the moon, along with animals, plants, minerals, and the four basic elements. According to him, all of these entities are chains that are arranged in stages and form a harmonious unity because everything comes from the First One (Allah) (Karaman, 2025).

In addition, Muslim philosophers and theologians' attention to the environment and nature also serves as a way to know the Creator. Al-Kindi and the majority of theologians are of the opinion that everything in this realm is new (*hadith*); since nature is a collection of new parts, it must have a Creator. While al-Farabi and Ibn Sina, who argue about the temporal permanence of nature, state that all entities are possible (*mumkin al-wujud*) and therefore require the *Wājib al-Wujūd*. A very careful order in the order of nature is evidence of the existence of a Regulator, namely Allah. The argument about the "postulates of *al-'inayah*" (the argument of divine providence) also shows that Allah subdued all creature inanimate objects, plants, and animals for the benefit of man in his life. The environment created from nothingness is also used as a basis by Muslim philosophers in what is known as "*dalil al-*

ikhtira" (creation argument). From the aesthetic side, Abu Hayyan al-Tawhidi views that everything that Allah creates is beautiful because it comes from Him who bestows beauty (Gabsi, 2024). He also associates the concept of beauty with utility, something that is beneficial is beautiful, while that which is detrimental is bad.

Historical and Cultural Foundations of Abbasid Environmental Practices

The development of environmental governance during the Abbasid Dynasty cannot be understood as a phenomenon that appeared suddenly, but rather as the result of the accumulation of ecological, cultural, and intellectual traditions that had developed in Near Eastern civilizations before and in the early Islamic period (Allahham, 2025a). In addition to being based on environmental ethics sourced from the Qur'an and Sunnah, the Abbasid people also inherited practical knowledge of water management, agriculture, and the art of landscaping from various civilizations that had long flourished in the Mesopotamian region. Thus, the success of the Abbasid in building a developed urban environment was the result of the process of adaptation, assimilation, and refinement of various local traditions into the framework of Islamic values. One of the cultural heritages that had a great influence on the development of the Abbasid urban landscape was the Mesopotamian tradition of landscaping. The love of nature that later flourished in Baghdad and Samarra was rooted in horticultural practices that have long been known in the Iraqi region (UNESCO, 2025). Prior to the establishment of the Abbasid Dynasty, the Christian communities around the monastery had developed the garden as part of religious life as well as a productive space that combined aesthetic, recreational, and natural resource functions (Rivera et al., 2025). This tradition developed according to the geographical character of Mesopotamia which had different topographic and climatic conditions from Persia and Byzantium, thus giving birth to a distinctive form of landscaping that was more responsive to the local environment.

The tradition in turn was enriched by the long experience of the Mesopotamian people in managing landscapes in relatively arid regions. Since the time of the Assyrians and Babylonians, the construction of the park was intended not only as a symbol of the splendor of the rulers, but also as an ecological solution to create green space in the midst of an environment dominated by dry plains. The legend of the Hanging Gardens of Babylon reflects the ability of hydraulic engineering as well as an understanding of the importance of vegetation in creating a comfortable urban climate. The historical experience provided the technical and aesthetic foundations that were later inherited by Islamic societies when the center of government moved to the Mesopotamian region. However, Abbasid landscaping was not just a reproduction of earlier traditions. The Abbasid civilization succeeded in transforming various cultural elements from Arab, Persian, Syriac, Turkish, as well as Christian, Mandaean, and Zoroastrian communities into a new form that reflected the character of Islam (Melvin-Koushki, 2025). This process shows that Abbasid culture developed through creative acculturation mechanisms, not just imitations of previous civilizations. The political and intellectual openness of the Abbasid government allowed various ethnic and religious groups to contribute in the fields of architecture, engineering, agriculture, and science (Ibn-Abi, 2010). Therefore, the progress of the Abbasid urban environment was the result of cross-cultural collaboration united by a relatively inclusive and science-oriented Islamic system of government.

The process of inheritance began to be seen from the beginning of the establishment of the Abbasid government. After replacing the Umayyad Dynasty in 750 AD, the Abbasid caliphs moved the seat of government from Damascus to Iraq, a region that has had an urban tradition and a thriving environmental management system for centuries. The first caliph, Abu al-Abbas al-Saffah, first established his seat of government in al-Hasyimiyyah before later moving it to the adjacent area of Mar Yunan Monastery (Yāqūt al-Ḥamawī, 1977). The area is known to have beautiful and well-organized gardens so that it is often a stopover place for officials and caliphs. The beauty of this landscape was even immortalized by contemporary poets who described narcissus, anemones, violets, lilies, and various other plants as symbols of beauty, tranquility, and prosperity. The tradition of appreciation for the garden then took on a more systematic form during the Abbasid period through the construction of palace gardens, green open spaces, and urban landscapes that culminated in the development of Baghdad and Samarra (Shābushtī, 1951). Thus, ecological development in the Abbasid period was a continuation as well as a creative transformation of the environmental heritage that had long developed in the Mesopotamian civilization and the early Islamic world.

Environmental Management in the Abbasid Dynasty

As for Abu Ja'far al-Mansur (754–775 AD), the second Abbasid caliph who in many ways is considered the true founder of the new dynasty, established the permanent capital of the Abbasid in a new city on the west bank of the Tigris River, not far from the ruins of the ancient Sasanian Persian capital, Ctesiphon (Jawād & Sūsah, 1958). The new city later acquired the official name *Madinat al-Salām* (City of Peace) or *Dār al-Salām* (Land of Peace), a designation that appears twice in the Qur'an (QS. al-An'ām [6]:127 and QS. Yūnus [10]:25–26) with the meaning of heaven. Since the Abbasid dynasty was born through a movement that was religiously charged and made religion the basis for unity and legitimacy of power, it is very possible that the Qur'anic meaning was the inspiration for the naming of the city (Al-Baghdādī, 2002, Vol. 1 p. 364–369). The first Abbasid was built in the garden area of Mar Fathion Monastery by the founder of Baghdad soon after the city was completed. The palace was named *Qaṣr al-Khuld* which means Palace of Eternity, which is heaven. Seven years later a second palace was built in the same park with the name *Qaṣr al-Qarār* which means Palace of Peace, a Qur'anic designation that is also reminiscent of the image of heaven. In addition, Al-Muqaddasī in *Aḥsan al-Taqāsīm fī Maʿrifat al-Aqālīm* describes various regions by taking into account the quality of air, water, soil, produce, and the characteristics of their inhabitants (al-Muqaddasī, 1906, p. 2).

In general, the history of Abbasid art is almost entirely concerned with the two main cities, namely Baghdad and Samarra (al-Yaʿqūbī, 1883, Vol. 2 p. 573–587). Samarra was the second Abbasid capital built about 110 kilometers north of Baghdad in 835 AD by Al-Mu'tasim to house his Turkish troops. In the early stages, the monastery's horticultural art seems to have had a great influence on the Abbasid style of gardening. Over time, however, the Persian influence grew stronger and the Abbasid gardens developed to become much more grandiose and intricate. This style is characterized by the use of expensive and glittering materials that are prominently displayed to show the social standing, wealth, and splendor of the owner. This character was evident in the palaces in Samarra and later in Baghdad. After Al-Mu'tamid left Samarra and returned to Baghdad in 892 A.D., his nephew, Al-Mu'tadid, two years later began building the *Qaṣr al-Tāj* (Crown Palace) on the banks of the Tigris River. Shortly afterwards he decided to build another palace about two miles to the northeast, namely *Qaṣr al-Thurayyā* (Pleiades Palace). The two palaces are connected by an underground tunnel more than three kilometers long. Around the palace were built vast gardens, and in the center of which was dug a large artificial lake that drained water through a canal that connected the Moses River in the east with the Tigris River in the west (Yāqūt al-Ḥamawī, 1977, p. 75). In addition, al-Muʿtaḍid reportedly built an animal husbandry complex that housed various types of animals, reflecting the tradition of royal patronage of parks and animal collections that had previously flourished in the Abbasid court, particularly during al-Mutawakkil's reign in Samarra. This practice shows a concern for the management of parks, cultivation spaces, and biological resources within the royal environment. At the same time, supportive environmental conditions are closely linked to agricultural productivity and economic well-being, as soil fertility and water availability are important factors in sustaining settlements and people's livelihoods. Islamic cities in the past also portrayed the existence of parks, farmland, and water-related infrastructure as an important part of the urban environment (Al-Masʿūdī, 1989, Vol. 2 p. 302, 4 p. 702).

In the 9th century AD, the son of Harun al-Rashid, a figure who in the Western world is synonymous with the story of the Thousand and One Nights, founded a new Abbasid capital which was first named *Surra Man Raʾā* (blessed are those who see it), then better known as Samarra. This city located on the banks of the Tigris River even surpasses Baghdad in its luxury and splendor.

Visually, Figure 1 illustrates that Baghdad's urban development took place within an urban space closely interconnected with the natural landscape and water infrastructure. Al-Ya'qubi, writing in 889 AD, reported that the entire city area had been transformed by al-Mu'tasim into gardens for the elite. Each park is equipped with a palace, hall, pond, as well as an equestrian and polo arena. His son, al-Mutawakkil, who was very fond of roses, even surpassed his father in the construction of palaces with extraordinarily beautiful gardens (al-Yaʿqūbī, 1883, Vol. 2 p. 575). Archaeological data combined with literary sources show that one of al-Mutawakkil's seventeen palaces, *al-Jawsaq al-Khaqānī*, has an area gardens equipped with pavilions, halls, and large ponds, while the entire complex is surrounded by walls (Khalīlī, 1965). Even the sistana called Qaṣr al-Ṣabīḥ is equipped with a garden with a waterwheel (noria), and the animal used to drive the wheels of the wheel is not cows as is commonly used, but ostriches as al-Buḥturī explains the palace in his verse:

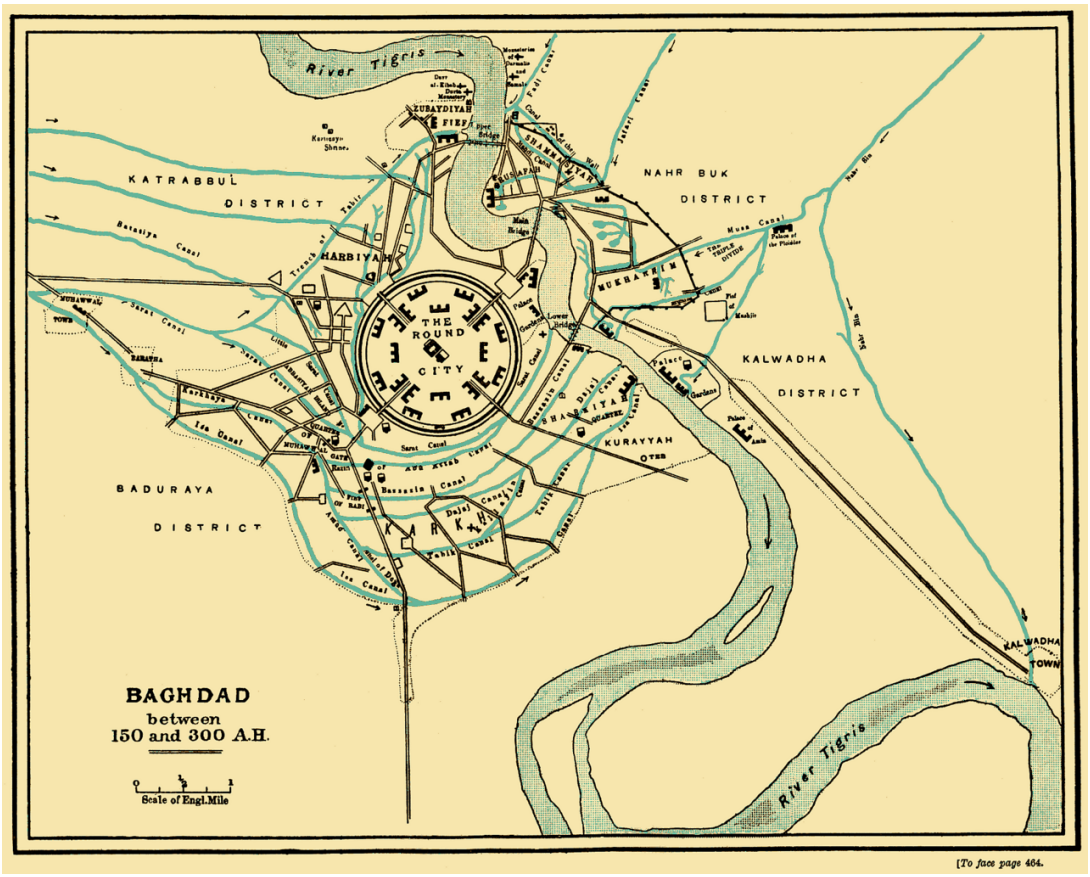


Figure 1. The Round City of Baghdad Abbasid Period (Le Strange, 2005)

مُستَمِدٌّ بِجَدوَلٍ مِن عُبابِ الماءِ كَالأَبيَضِ الصَقيلِ الحُسام ... فَإِذا ما تَوَسَّطَ البِركَةَ الخَضراءَ أَلقَت عَلَيهِ صِبغَ الرُخامِ

فَتَراهُ كَأَنَّهُ ماءُ بَحرٍ يَخدَعُ العَينَ وَهوَ ماءُ غَمامِ ◆ وَالدَواليبُ إِذ يَدُرنَ وَلا ناضِحُ يُسقى بِهِنَّ غَيرُ النَعامِ

The water was flowing through a creek that came from the rush of water, like a white sword that was sharpened and shining. When the water reached the middle of the green pool, the marble reflected its color and beauty on the water. So you saw it as if it were the water of the sea, which deceives the eyes, when in fact it is the water of the clouds. And the wheels of the water turned, with no water-sucking animal to move them except the ostrich (al-Ṣayrafi, 2009, p. 2006).

One of al-Mutawakkil's favorite projects in Samarra was *Ḥayr al-Waḥsh*, which is a zoo or zoological park that he built in the south of the city as a place of private recreation. There are more than two thousand types of animals, both wild and domesticated. In addition, an extraordinarily beautiful rustic palace was built with a giant pond in front of it (Robinson, 2001). In terms of design, the pool is not only a symbol of extraordinary luxury, but also shows the sophistication of engineering techniques of its time. An artificial river called the Nayzak flows from the northern part of the Tigris River through the entire park, then passes through a large pond before finally emptying back into the Tigris River. The entire area was planted with trees and shrubs brought from various areas of the caliphate (Susa, 1948). The wildlife is kept in very spacious cages and cared for by keepers who have received special training (al-Ṣayrafi, 2009).

Figure 2 above illustrates, a number of artificial waterfalls were also built. The scene inspired a court poet who described the waterfall as "like a pack of horses galloping," while the gardens surrounding the pond "resemble the feathers of a peacock's tail in colorful beauty."

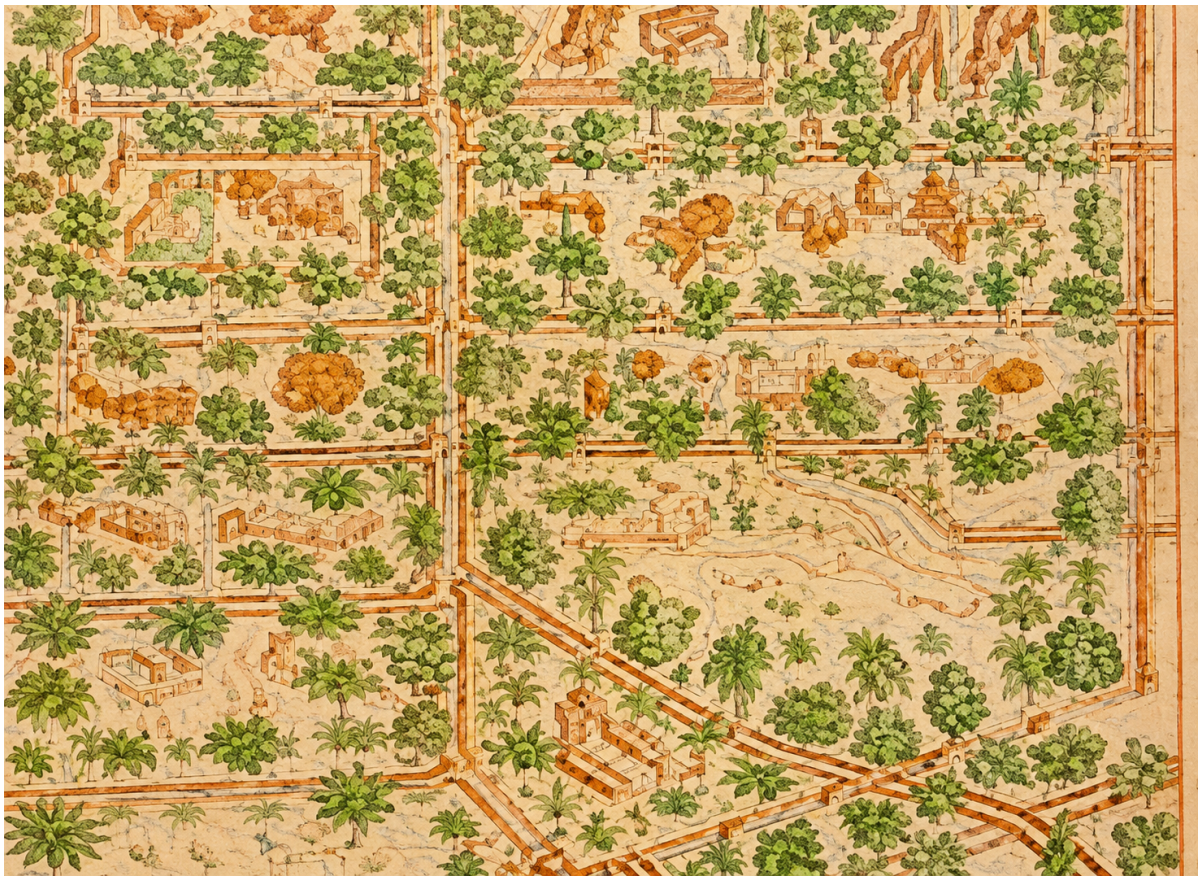


Figure 2. Historical reconstruction of Ḥayr al-Wuḥūsh based on the poems of al-Buḥturī (Al-Samarrai, 1991, p. 121)

After the seat of government was moved back from Samarra to Baghdad, construction activities took place very rapidly. Within a few years, rows of caliphate palaces sprang up on the eastern bank of the Tigris River to form a distinct area filled with magnificent buildings and vast gardens. The entire complex is surrounded by circular walls that have their own gates, while the Tigris River is the main axis of its spatial layout. Inside the royal complex there are twenty-three palaces. Among the most famous are *Qaṣr al-Tāj* (Crown Palace), *Qaṣr al-Firdaws* (Paradise Palace), and House of the Tree. The houses are designed with adequate ventilation so that fresh air enters and sunlight reaches the entire room (Ibn Kathīr, 2021, p. 127–128). These three buildings are often mentioned in various historical and literary sources, especially in connection with the visit of the Byzantine Empire delegation to the court of Al-Muqtadir in 917 AD.

The Byzantine envoys reported that the palace gardens stretched as far as the banks of the Tigris River. They also expressed their admiration for the splendor they witnessed. Before entering the main palace, they passed through the halls and marble passages of a building called the Riding House. Next to it is a very large animal park with special buildings to keep various wild animals, such as elephants, a hundred lions, giraffes, and leopards. Even some of the animals in the zoo are tame enough to eat directly from the hands of visitors (Mohamed, 2025). Historical

sources also mention that the Tree House stands in the middle of a very beautiful garden. The building got its name from an artificial tree made of gold and silver, which stood in the middle of a large pond in front of the palace's main reception room. The tree has eighteen main branches made of gold and silver, with countless branches. The entire branch is decorated with fruits that are actually gemstones. On each branch are perched birds of gold and silver. As the wind blew past the tree, the mechanical birds made a very melodious whistling and singing sound.

To show how great the Abbasid love of nature was, the historian Al-Mas'udi notes that Al-Qahir (r. 932–934 AD) was very fond of nature (Al-Masʿūdī, 1989, p. 409). By his order a garden was built in one of the courtyards of *Qaṣr al-Tāj*. Although it is only about 1,500 square meters, the park is filled with orange trees imported from Basrah, as well as various other types of trees imported from Oman and India. The trees that are planted tightly but still neatly arranged produce yellow and red fruits that sparkle like stars in the night sky. Under the trees grow various shrubs, fragrant aromatic plants, a variety of flowers, and various other ornamental plants. Al-Qahir also enriched his garden with various types of birds, such as vultures, pigeons, blackbirds, and parrots brought from various distant lands.

The use of ornamental plants, various water devices, zoos, very large ponds, and fountains show the combination of various ecological ideas and traditions that eventually gave birth to the distinctive form of the garden, which is now known as the Abbasiya garden.

Political and Economic Dimensions in Abbasid Governance

The interpretation of environmental governance in the Abbasid period took place in a social and political space that brought together the interests of power, economy, recreation, public health, and religious values. The construction of parks, water systems, sanitation facilities, and irrigation networks were part of the development of the Abbasid built environment, but the function of each facility was not singular. Studies of Abbasid court gardens in Mesopotamia show that gardens were an important part of the social and daily life of the palace and were closely related to the architecture, landscape, water, flora, fauna, and setting of the palace space. Archaeological and textual evidence of the Abbasid gardens in Samarra, for example, shows a link between the garden and the palace complex and the life of the palace, while the choice of vegetation, fauna, and water element is also related to the prestige and geographical conditions of the local (Mahmoudian, 2025).

For example, the construction of al-Mutawakkiliyya during the time of al-Mutawakkil shows a strong link between the built environment and the politics of power. The new complex was built as part of the reorganization of the Samarra region and was equipped with various facilities related to the life of the palace. The Nahr al-Jaʿfarī canal, for example, was built on al-Mutawakkil's orders to supply water to the new area, first for the palace complex and then to the wider area (Van Den Bent & Brown, 2025). Studies of the Abbasid palace gardens also show that gardens, ponds, aqueducts, and audience rooms are part of the architectural configuration of the palace and daily life in the palace environment (Mahmoudian, 2025). Thus, the Abbasid palace environment is more appropriately understood as a space that combines political, recreative, aesthetic, and social functions, rather than directly being treated as a form of environmental conservation in the modern sense. It also shows that the relationship between the garden and the audience room is part of the palace architectural configuration, so that the garden can be understood in relation to the palace's life and culture. Thus, the Abbasid palace environment is more appropriately understood as a space that combines political, recreative, aesthetic, and social functions.

The economic dimension is more evident in water and irrigation management. The Mesopotamian region had a high dependence on irrigation systems to maintain agricultural productivity. Canals, dams, distribution channels, and water lifting devices allowed the management of water resources for agricultural and settlement needs. In the Abbasid fiscal context, agricultural productivity had a direct relationship with state revenues through *kharāj* (Sadr, 2016). The management of the water network can be understood as part of the economic infrastructure that supports agrarian production and the fiscal capacity of the state. The management of the water network can be understood as part of the economic infrastructure that supports agrarian production and the fiscal capacity of the state. Water management in the Abbasid period involved various actors, ranging from government authorities to the community. These economic interests do not eliminate the social dimension of water management. Water is a basic need of urban communities and has strong social and religious values in the Islamic tradition. The provision and utilization of water indicates the regulation of rivers, wells, canals, and the right of communities to obtain water (Abū Yūsuf Yaʿqūb ibn Ibrāhīm, 1984, p. 53–54).

The aspect of public health provides an important dimension in the development of the urban environment during the Abbasid period. Water management and sanitation are part of the basic needs of the community as well as an important element in maintaining the order and sustainability of urban life. Historical evidence of Abbasid urban practices shows the construction of public bathing facilities, the management of canals and waterways, and the regulation of sewage disposal locations so that they are not adjacent to water sources used for consumption (Ibn al-Faqīh, 1996, p. 289). In this framework, sanitation can be understood primarily as part of public health and urban order. The ecological consequences can indeed be in the form of improving the quality of the environment, but its historical function is closely related to the needs of the community and urban management.

The normative dimension of Islam provides a broader framework for the practice of managing these natural resources. Abū Yūsuf in Kitāb al-Kharāj explains that if the construction of a canal is seen as beneficial for the improvement of kharāj, the ruler can order the digging of the canal and the financing is charged to the bayt al-māl, not to the people living in the area. He placed the government as the party responsible for the construction and

maintenance of canals because the existence of irrigation infrastructure is closely related to the sustainability and productivity of agriculture (Abū Yūsuf Yaʿqūb ibn Ibrāhīm, 1984, p. 110). In Maʿālim al-qurba fī aḥkām al-ḥ isbah, Ibn al-Ukhuwwah places supervision of ḥammām (public baths) and activities related to cleanliness as part of the responsibility of muḥtasib. He, for example, forbids the use of such facilities for activities that may cause disturbance to the community, including skinwashing activities that produce odors and have the potential to harm other users (Ibn al-Ukhuwwah, 1976, pp. 240–244). In al-Juwaynī's perspective, this kind of consideration is relevant to the orientation of the shari'a to the realization of benefits and the prevention of things that are contrary to it (al-Juwaynī, 1997, p. 923). Meanwhile, the idea of amānah and mīzān is understood as an ethical principle derived from the Qur'an that can broaden the reading, especially in seeing human responsibility for resources and the importance of maintaining a balance in their use.

Meanwhile, the concept *of ḥimā* needs to be placed in a different category. Al-Rabadhah is an important example of *the ḥimā region* that has rules for the use of resources and is associated with the public interest, especially the grazing of certain animals (Rāshid, 1986, pp. 88–89). However, the origins *of ḥimā* al-Rabadhah are placed in the time of the early caliph, not as a policy first created by the Abbasids (Gari, 2006). Therefore, its existence cannot be directly used as evidence that the Abbasid government created a new conservation policy. The literature on the history *of the ḥimā* indicates that the system developed as a mechanism for the protection of grazing pastures and resources, while other sources on al-Rabadhah indicate restrictions on access based on the type and function of animals, including animals related to jihad interests and charitable activities. In the Abbasid context, stronger evidence of the normative dimension *of ḥimā* can be attributed to al-Māwardī's work, *al-Aḥkām al-Sulṭāniyya*, which was compiled in the context of the Abbasid caliphate. The work is one of the comprehensive jurisprudence manuals of government jurisprudence and discusses the structure of authority and administrative issues of government (Māwardī, 1989). However, Daniel Lav's study shows that al-Māwardī's work must also be understood as a legal formulation and legitimacy of the government structure in the Abbasid period that was already under Buwayhid domination, so that its normative provisions do not automatically prove that every rule formulated is really applied uniformly throughout the Abbasid territories (Lav, 2025).

Thus, environmental governance in the Abbasid period can be understood as the result of an interaction between political, economic, recreational, public health, administrative, and religious values. The construction of parks and palace complexes mainly exhibits the cultural and political dimensions of the elite; irrigation networks are closely related to the agriculture and fiscal of the state; urban water management has social and economic dimensions; while sanitation is concerned with the health and order of the city. The relationship between these various dimensions results in a built environment that has ecological consequences, although such ecological significance is not always the explicit goal of every practice. Therefore, the ecological reading of Abbasid governance is understood as a contemporary interpretation that departs from historical evidence. At the same time, this approach maintains the distinction between the historical purpose of a practice and the ecological relevance read by contemporary research.

What Islamic Education Can Learn from Abbasid Environmental Practices

The epistemology of Islamic education with an ecological dimension finds its historical legitimacy when the ecological dimension is examined in the experience of Abbasid civilization. In this period, ontological assumptions about the unity of existence that place humans and nature in a coherent and interdependent existential network did not stop as metaphysical speculation, but rather were articulated in scientific structures and social governance. An integralistic paradigm that rejected the sharp separation between the sovereign subject and nature as a passive object was reflected in the way the Abbasid people built, cities, managed water, designed sanitation systems, and developed medical sciences and geography that considered environmental quality as a prerequisite for health and well-being. Nature is understood as a manifestation of *āyāt kauniyyah* which contains a theological as well as a rational message. Therefore, its management is part of the awareness of worship and collective responsibility.

In this horizon, the caliphate mandate acquires a pragmatic dimension. Humans who ontologically share elements with the earth are positioned as agents of order, not domineering actors who are free from normative boundaries (Heikkurinen et al., 2021). The principle of trust crystallizes in public policy and technological innovation that pays attention to *mīzān* (balance) and the prevention of *fasād* (damage). The construction of dams, irrigation canals, green spaces, and industrial arrangements so as not to pollute settlements show that sustainability is understood as an ethical consequence of faith structures. Thus, the ecological dimension of the Abbasid period represented a synthesis between theology, scientific rationality, and social responsibility, which formed a pattern of benefit-oriented civilization.

This epistemological framework is not only sourced from the normative texts of the Qur'an and the Sunnah, but also develops through a creative dialectic between revelation, reason, and empirical experience as reflected in the classical Islamic intellectual tradition (Siregar & Rangkuti, 2023b). Muslim theologians and philosophers built cosmological arguments that placed the order of nature as an indication of divine wisdom and providence, while scientists and practitioners in the Abbasid period translated this theological consciousness into concrete policies, such as urban planning that pays attention to air and water quality, sanitation management, dam construction, and concern for animal welfare (Douglass & Facchine, 2025). This historical evidence demonstrates that ecological knowledge in Islam is not merely normative but is translated into systematic civilizational practices aimed at promoting the public good. Nature in this construction is understood as a space of civilization that contains biological, social, intellectual, and spiritual dimensions simultaneously (Alves & Vidal, 2023). Therefore, its management cannot be reduced to a technocratic or administrative affair, but must be placed within the framework of moral responsibility that comes from theological consciousness. The value of sustainability in that period operates

as a concrete expression of collective piety, in which ecological harmony is seen as part of the cosmic order that must be maintained. The dichotomy between religious science and natural science loses its relevance when all forms of knowledge are directed to reading the order of the cosmos as an expression of Divine wisdom (Siregar & Rangkuti, 2023a). Reality is not perceived as an aggregation of independent entities, but rather as a relational network loaded with ethical and metaphysical significance. Each element of nature contains a symbolic dimension that opens up a space for contemplation, as well as a material dimension that demands responsible management. Consequently, the educational process is directed at the formation of reflective consciousness that is able to integrate tafakkur, rational analysis, and moral sensitivity in reading nature as a signifying space. Learners are encouraged to see the environment not just as a resource, but as a cosmic text that calls for interpretation, reverence, and nurturing. In this context, education serves as an arena for the formation of subjects who realize that their existence is bound in history and assume transgenerational responsibilities. Thus, the orientation of tawḥīd, does not simply strengthen religious identity, but builds a civilizational consciousness that places the sustainability of life as an integral part of servitude to God.

Implementably, this ecologically-oriented Islamic education model is proposed as a conceptual design that has not been empirically tested, which can be adapted by madrassas and pesantren according to the characteristics of students, curriculum, and institutional environmental conditions. Learning outcomes are formulated using measurable operational verbs, including the ability to identify ecological principles in the Qur'an and Sunnah, analyze environmental management practices in the Abbasid period, evaluate their relevance to environmental problems around madrassas and pesantren, design solutions based on Islamic values, and demonstrate environmental conservation behavior in daily life. These competencies are directed at the formation of students who have ecological literacy, critical thinking skills, social responsibility, and awareness of carrying out the mandate as *khalīfah fī al-arḍ*. As such, the model is not intended to assert proven effectiveness, but rather offers a learning framework that connects Islamic historical knowledge, religious values, ecological understanding, and environmental actions that can be tested in subsequent research.

Curriculum development is carried out by integrating Islamic and scientific materials through ecological themes that have historical foundations in the Abbasid civilization. The concept *of ḥimā* is used as a basis for learning about regional conservation and natural resource protection in the subjects of Fiqh, Moral Faith, and Islamic Religious Education. Water management systems in the cities of Baghdad and Samarra can be integrated into science, geography, or contextual learning as material to study water resource management. Studies on urban sanitation, waste management, greening, and spatial planning can be placed as an illustration of the relationship between the development of science, environmental ethics, and Islamic civilization. However, each historical case used in learning must first be based on verified historical sources and distinguish between historical facts, scientific interpretations, and contemporary ecological readings. The integration between these subjects is directed so that learners understand the relationship between religious values and the responsibility to protect the environment without assuming that every historical practice is automatically a form of modern conservation.

As an operational illustration, one learning unit can be designed with the theme "Water Management in the Abbasid Civilization and Water Conservation in Madrasah or Islamic Boarding School". This unit is intended for students at the Madrasah Tsanawiyah or Madrasah Aliyah level and can be carried out in 4 meetings or 8 hours of lessons, which consists of strengthening historical concepts and studies, investigating water use, data analysis, and preparing and presenting conservation plans. Historical material includes verified sources regarding water management in the Abbasid period, especially water distribution systems, canals, dams, or hydraulic infrastructure relevant to the selected case. The material is then linked to the principles *of mīzān*, *amānah*, *khalīfah fī al-arḍ*, and the prevention *of fasād* as an ethical framework in understanding human responsibility for natural resources. Learning resources consist of primary historical texts or verified scientific editions, academic literature on Abbasid water infrastructure, the Qur'an and relevant hadiths, science or geography textbooks, data on the use of water in madrasas or pesantren, and student worksheets.

The learning outcomes of the unit are formulated in a measurable manner. Upon completion of the unit, students are expected to be able to: (1) identify at least three Islamic principles related to responsibility for water and the environment; (2) explain at least one water management practice in the Abbasid period based on verifiable historical sources; (3) collect and present water use data in madrassas or pesantren during the specified observation period; (4) analyze at least two water use issues based on field data; (5) design a realistic water conservation action based on Islamic values; and (6) present the results of the investigation by demonstrating the relationship between historical evidence, Islamic ecological principles, and contemporary environmental issues. These achievements allow the relationship between learning activities and assessments to be explicitly established and observable.

The learning process is carried out in four continuous meetings. The first meeting focuses on conceptual and historical reinforcement. The teacher presents verses and hadiths that are relevant to human trust in nature, then students read historical sources about water management in the Abbasid period. Students work in groups to identify the form of water management, its purpose, its social context, and the textual evidence that supports it. This activity is directed at the achievement of identifying ecological principles and explaining historical practices. The second meeting focuses on investigating the local environment. Students conduct a simple audit of water use in madrassas or pesantren by observing water use points, recording usage patterns, identifying potential waste, and, if possible, using available meter data or water use records. Teachers ensure that data collection is carried out safely and does not interfere with institutional activities. This activity is directed at the achievement of collecting and presenting environmental data.

The third meeting is the stage of analysis and design of solutions through *project-based learning*. The group of students compares the findings of the water audit with the principles of resource management in historical sources and Islamic values. They then develop a realistic water conservation proposal, such as improving water use habits, scheduling leak checks, installing water-saving reminders, regulating water use for specific activities, or proposing safe and appropriate water reuse in accordance with local conditions. The proposal should contain the problems found, evidence of data, Islamic principles used, proposed actions, responsible parties, resources needed, and indicators of success. The fourth meeting is used for the presentation of results, feedback, reflection, and the preparation of a follow-up plan. Students present group products, explain the relationship between Abbasid cases and water problems in their environment, receive input from teachers and other groups, and then write reflections on changes in understanding and actions that can be taken individually or collectively. The main learning product is in the form of a "Water Conservation Action Plan Based on Islamic Values", which is complemented by a summary of historical evidence, results of water use audits, identification of problems, relevant Islamic principles, action plans, division of responsibilities, and indicators of success. Supporting products can be in the form of simple tables or graphs on water use, educational posters, reflection journals, and group presentations. The product is chosen so that students do not stop at historical understanding, but are able to relate historical knowledge with the analysis of the surrounding environment and formulate actions that can be taken. However, the preparation and application of the product in this design cannot be seen as evidence of the effectiveness of the model, as the design is still a conceptual recommendation that requires empirical testing in subsequent research.

Assessments are conducted in an integrated manner by linking each activity to learning outcomes. The ability to identify ecological principles and understand historical practices is assessed through text analysis, written questions, and brief presentations. The ability to collect and analyze data is assessed through water audit sheets and data interpretation. The ability to design solutions is assessed through water conservation proposals, while the ability to apply ecological responsibility is assessed through observation of participation, cooperation, responsibility, and consistency during the project. Individual reflection is used to assess learners' ability to relate historical knowledge, Islamic values, and environmental responsibility. Thus, the assessment measures not only knowledge mastery, but also analytical skills, attitudes, and action planning. The following short rubrics can be used to assess the product and performance of the learners:

Table 4. Assessment Rubric

Aspects Assessed	Level 4 – Excellent	Level 3 – Good	Level 2 – Sufficient	Level 1 – Needs Improvement
Historical evidence	Using verified sources, accurately describing historical context, and connecting them to learning problems	Use relevant sources and explain the context in general	Sources are used but context or explanation is still limited000000	Historical claims are unclear or unsupported by sources
Ecological analysis	Identify problems based on data and explain cause-and-effect relationships logically	Identify issues and provide adequate analysis	Problems found but the analysis is still descriptive	Unable to connect data with the problem
Integration of Islamic values	Connecting *amānah*, *mīzān*, *khalīfah fī al-ard*, or *fasād* with precise actions	Using relevant Islamic values but not yet in-depth explanations	Mentioning Islamic values without a strong connection to action	Does not show the relationship between Islamic values and actions
Collaboration and presentation	**Actively participate, share tasks fairly, and present findings systematically**	**Participate and present results clearly enough**	**Participation or presentation is still inconsistent**	**Participation is very limited and results are not well communicated**

As shown in Table 4 above, Indicators of success at the learning unit level can be determined based on the achievement of learning outcomes, not on claims that the model has proven effective. Operationally, these indicators include: students are able to provide source evidence for the historical claims used; be able to present water audit data systematically; be able to identify at least two water use issues based on data; be able to relate these issues to at least one relevant Islamic ethical principle; be able to produce conservation proposals that have clear actions, responsible persons, resources, and indicators of success; and are able to explain the relationship between Abbasid history learning and contemporary environmental issues. These indicators serve as criteria for assessing learning outcomes in the proposed unit and not as evidence of the overall effectiveness of the model. Outside of the learning unit, the learning process can be developed through five main stages. The first stage is in the form of conceptual reinforcement through the study of *āyāt kauniyyah*, hadith, *turāth* books that discuss human trust to nature, as well as historical sources regarding environmental management practices during the Abbasid period. The second stage is directed at identifying environmental problems in the madrasah or pesantren area, such as waste management, water use, dormitory cleanliness, sanitation, greening, and land use. The third stage is carried out through project-based learning, which allows students to organize and implement environmental projects collaboratively. The fourth stage is in the form of *field experience*, such as observations to conservation areas, educational gardens, water treatment plants, or community-based environmental management institutions. The fifth stage ended with the presentation of project results, reflection based on Islamic values, and the preparation of a follow-up plan. The five stages are pedagogical designs that can be adjusted and have not been tested as models that have proven effective.

Institutional support is an important component in the implementation of the proposed design. The head of the madrasah or pesantren leader is responsible for setting policy direction, providing institutional support, and ensuring the availability of necessary time and resources. Subject teachers are responsible for integrating ecological themes into learning, facilitating the analysis of historical sources, guiding projects, and carrying out assessments. Teachers of Science, Geography, or related subjects can assist with the collection and analysis of environmental data. Ustaz or religious education managers play a role in strengthening the meaning of the values *of amānah*, *mīzān*, *khalīfah fī al-arḍ*, and the prevention of *fasād*. Education personnel and facility managers are responsible for providing water use data, helping to identify technical needs, and supporting the implementation of actions under institutional authority. Students play the role of the main implementers of investigation and project activities, while the madrasah or pesantren environmental team coordinates, monitors, and documentation. This division of responsibility is necessary so that ecological education does not stop as a classroom activity, but remains connected to the institution's environmental governance. At the institutional level, this design can be integrated into the governance of madrasas and pesantren through *eco-madrasah* and *green pesantren programs*. The proposed policies include the integration of environmental education into the curriculum and extracurricular activities; the formation of an environmental management team consisting of madrasah heads or pesantren leaders, teachers, ustaz, education staff, and students; waste management based on sorting, reduction, and recycling; water and energy saving; development of green areas through productive gardens, educational gardens, and tree planting; strengthening sanitation of dormitories, mosques, classrooms, and public facilities; as well as periodic evaluations based on indicators of cleanliness, efficiency in the use of resources, participation of institutional citizens, and sustainability of activities. In the context of this conceptual design, the policy is positioned as an institutional recommendation, not as evidence that *a particular eco-madrasah* or *green pesantren* program has produced a proven impact. Thus, the operationalization of the ecological model of Islamic education can be understood as a design that connects three layers of learning: historical knowledge, ethical-religious reflection, and contextual ecological action.

Conclusion

This study concludes that various thoughts and practices in the Abbasid period show the interconnectedness between religious values, rationality, and social responsibility in the management of people's lives. The principles of trust, mīzān (balance), prohibition of fasād (damage), and lā ḍarar wa l ā ḍirār provide a normative framework in the Islamic tradition regarding human relations with nature and resources. However, these principles are not positioned as direct evidence that the Abbasid people already had the concept of ecology or environmental awareness in a contemporary sense. Its relationship with ecological ideas is a contemporary analytical reading based on its relevance to today's environmental issues.

An analysis of social practices in the Abbasid period shows that concern for the environment was manifested in urban governance, water management, sanitation systems, the construction of dams and canals, and the development of green spaces. In their historical context, these practices are related to political needs, agriculture, public health, public welfare, and the economic interests of the state. Therefore, not all of these practices can be directly categorized as ecological practices. Its ecological dimension is understood as a contemporary interpretation that departs from historical evidence, especially when the practice shows concern for the use of resources, prevention of losses, public health, and the protection of common interests.

Its implications for Islamic education lie in the possibility of developing a historical-ecological perspective that connects the normative treasures of Islam with the challenges of the contemporary environment. Values such as amanah, mīzān, benefit, and prevention of *harm* can be reread in dialogue with modern ecological issues, without ignoring the social, political, economic, and intellectual context in which these values evolved. Similarly, the idea of nature as *kauniyah verses* and its relationship to tawḥīd can be used as a theological framework for contemporary ecological reinterpretation, not merely as a historical description of the way Abbasid society understood the environment. Thus, the contribution of this research is not to prove that the Abbasid civilization has applied the concept of sustainability, but rather to show that a number of practices and principles documented in the tradition can be read ecologically and critically utilized in the reconstruction of Islamic education that is contextual and responsive to global environmental crises.

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Conceptualization, F.N and T.ZA.; methodology and data analysis, F.N.; investigation and data collection, T.ZA.; writing—original draft, F.N.; writing—review and editing, F.N.; supervision, F.N. All authors have read and agreed to the published version of the manuscript.

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Conflict of Interest

The authors declare no conflicts of interest.

Declaration of Generative AI

During the preparation of this manuscript, the authors used AI-assisted technologies to improve language, grammar, and readability. All AI-generated suggestions were critically reviewed and revised by the authors, who assume full responsibility for the content and integrity of the published work.

References

A. Alamri, M. S., JM Muslimin, K. Wsuwetsa Mukti, & Rayhansyah Jasin. (2025). Text, Context and Natural Conservation: An Analysis of Muhammadiyah's and Nahdlatul Ulama's Islamic Legal Thought on Fiqh of Environment. *Nurani: Jurnal Kajian Syari'ah Dan Masyarakat*, *25*(2), 690–715. https://doi.org/10.19109/nurani.v25i2.31305

Abdulsalam, T. A., Tajudeen, R. B., Subair, M. L., Ogherohwo, T. F., & Raji, Y. M. (2025). Global Environmental Challenges in the Current Business Scenario: A Roadblock for Sustainable Development. In V. P. Gupta, A. K. Haghi, & S. Sharief (Eds.), *Green Economy and Sustainable Development* (pp. 253–282). Springer Nature Switzerland. https://doi.org/10.1007/978-3-031-92636-5_14

Abou-Tabickh, L. (2019). *Al-'Asabiyya in Context: Choice and Historical Continuity in Al-Muqaddima of Ibn Khaldūn*. University of Toronto (Canada). https://search.proquest.com

Abū Yūsuf Yaʿqūb ibn Ibrāhīm. (1984). *Kitāb al-Kharāj* (Maḥmūd al-Bājī, Ed.). Tunisia: Dār Būsallāmah li-l-Ṭibāʿah wa-l-Nashr wa-l-Tawzīʿ.

Al-Ālūsī, S. A.-D. (1994). Rūḥ al-Maʿānī Fī Tafsīr al-Qurān al-ʿaẓīm Wa al-Sabʿa al-Mathānī. *Beirūt: Dār Al Kutub Al 'Ilmiyyah*, *1415*, 11–48.

Al-Baghdādī, A. B. A. bin'. (2002). *Tārīkh Baghdād* (A. bin Thābit, Ed.). Beirut: Dār Gharb al-Islāmī.

al-Juwaynī, A. al-M. ʿAbd al-M. ibn ʿAbd A. ibn Y. (1997). *Al-Burhān fī Uṣūl al-Fiqh* (ʿAbd al-ʿAẓīm Maḥmūd al-Dīb, Ed.; Vol. 2). Miṣr: Dār al-Wafāʾ li-al-Ṭibāʿah wa-al-Nashr wa-al-Tawzīʿ.

Al-Masʿūdī, A. (1989). *Murūj al-Dhahab wa Maʿādin al-Jawhar*. Beirut: Dār al-Fikr.

al-Muqaddasī, M. (1906). *Aḥsan al-Taqāsīm fī Maʿrifat al-Aqālīm, edited by Michael Jan de Goeje*. Leiden: Brill.

al-Ṣayrafi, Ḥasan Kāmil. (2009). *Dīwān al-Buḥturī* (Vol. 3). Cairo: Dār al-Maʿārif.

al-Yaʿqūbī, A. I.-A.-Y. (1883). *Tārīḫ: Historiae*. Brill.

Allahham, A. (2025a). Beyond Dynasties: An Alternative Periodization of Islamic Built Environments—Interplay of Power, Jurisprudence, and Knowledge. *Journal of Urban History*, 00961442251371580. https://doi.org/10.1177/00961442251371580

Allahham, A. (2025b). The untold stories of “Islamic” architecture and urbanism: Rationality and power manifestations. *City, Territory and Architecture*, *12*(1), 19. https://doi.org/10.1186/s40410-025-00264-w

Alves, F., & Vidal, D. G. (2023). Plural Nature(s): An Overview of Their Sociocultural Construction. *Encyclopedia*, *4*(1), 1–12. https://doi.org/10.3390/encyclopedia4010001

Asif, S. S. (2025). Aesthetic Perception of Nature as the Foundation of Environmental Education. In J. Mahmudova, S. Aliyeva, V. Mammadova, F. Jalilova, M. Alizadeh, K. Dadashzadeh, I. Israfilov, I. Rahimli, O. Mir-Gasim, N. Mahdi, L. Huseynova, S. Shakhuseynova, M. Farajova, T. Akhmedova, S. Namazova, L. Chkhartishvili, T. Gultekin, Y. Polyakova, O. Sapanja, … A. Jumagulova (Eds.), *Proceedings of the Contribution of Culture to Ecological Sustainability (CCES 2024)* (Vol. 949, pp. 59–74). Atlantis Press SARL. https://doi.org/10.2991/978-2-38476-468-6_5

Bhattarai, K., & Yousef, M. (2025). Urbanization and Sustainability in MENA: Challenges and Pathways to Smart Cities. In K. Bhattarai & M. Yousef, *The Middle East* (pp. 167–216). Springer Nature Switzerland. https://doi.org/10.1007/978-3-031-83967-2_7

BMKG | Stasiun Pemantau Atmosfer Global (SPAG) Lore Lindu Bariri—Pemanasan Global. (n.d.). Retrieved March 3, 2026, from https://gaw-bariri.bmkg.go.id/index.php/karya-tulis-dan-artikel/gawsarium/247-pemanasan-global

Calvin, K., Dasgupta, D., Krinner, G., Mukherji, A., Thorne, P. W., Trisos, C., Romero, J., Aldunce, P., Barrett, K., Blanco, G., Cheung, W. W., Connors, S., Denton, F., Diongue-Niang, A., Dodman, D., Garschagen, M., Geden, O., Hayward, B., Jones, C.,... Ha, M. (2023). *IPCC, 2023: Climate Change 2023: Synthesis Report. Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, H. Lee and J. Romero (eds.)]. IPCC, Geneva, Switzerland*. https://doi.org/10.59327/ipcc/ar6-9789291691647

Chand, S. P. (2025). Methods of Data Collection in Qualitative Research: Interviews, Focus Groups, Observations, and Document Analysis. *Advances in Educational Research and Evaluation*, *6*(1), 303–317. https://doi.org/10.25082/AERE.2025.01.001

Douglass, S. L., & Facchine, T. (2025). *Islam in World History* (1st ed.). Routledge. https://doi.org/10.4324/9781032659206

Freeman, M. (2025). *Modes of Thinking for Qualitative Data Analysis* (2nd ed.). Routledge. https://doi.org/10.4324/9781003385172

Friedlingstein, P., O’Sullivan, M., Jones, M. W., Andrew, R. M., Bakker, D. C. E., Hauck, J., Landschützer, P., Quéré, C. L., Luijkx, I. T., Peters, G. P., Peters, W., Pongratz, J., Schwingshackl, C., Sitch, S., Canadell, J. G., Ciais, P., Jackson, R. B., Alin, S. R., Anthoni, P.,... Zheng, B. (2023). Global Carbon Budget 2023. *Earth System Science Data*, *15*(12), 5301–5369. https://doi.org/10.5194/essd-15-5301-2023

Gabsi, Z. (2024). Islam, Reason, and Modernity. In Z. Gabsi, *Muslim Perspectives on Islamophobia* (pp. 155–188). Springer Nature Switzerland. https://doi.org/10.1007/978-3-031-57300-2_6

Gari, L. (2006). A History of the Hima Conservation System. *Environment and History*, *12*(2), 213–228. https://doi.org/10.3197/096734006776680236

Heikkurinen, P., Clegg, S., Pinnington, A. H., Nicolopoulou, K., & Alcaraz, J. M. (2021). Managing the Anthropocene: Relational Agency and Power to Respect Planetary Boundaries. *Organization & Environment*, *34*(2), 267–286. https://doi.org/10.1177/1086026619881145

Ibn-Abi, A. I.-M. (2010). *Sulūk al-mālik fī tadbīr al-mamālik* (ʻAbd-al-ʻAzīz Ibn-Fahd Ibn-ʻAbd-al-ʻAzīz Āl Saʻūd, Ed.). Dār al-ʻĀḏirīya li-n-Našr wa-ʼt-Tauzīʻ.

Ibn al-Faqīh. (1996). *Kitāb al-Buldān* (Yusūf al-Hādī, Ed.). ʻĀlam al-Kutub.

Ibn al-Ukhuwwah. (1976). *Maʿālim al-Qurba fī Aḥkām al-Ḥisbah* (Muḥammad Maḥmūd Shaʿbān & Ṣiddīq Aḥmad ʻĪsā al-Muṭīʿī, Eds.). Cairo: al-Hayʾah al-Miṣriyyah al-ʻĀmmah li-l-Kitāb.

Ibn Kathīr. (2011). *Tafsīr al-Qur'ān al-ʻAẓīm* (Sāmī Ibn Muḥammad Salāmah, Ed.; Vol. 5). Dār Ṭayyibah li al-Nashr wa al-Tawzīʻ.

Ibn Kathīr, I. (2021). Al-Bidāyah wa al-nihāyah. *Dar Ibn Kathir, Damascus*.

Jawād, M., & Sūsah, A. (1958). *Dalīl khāriṭat Baghdād al-mufaṣṣal fī khiṭṭaṭ Baghdād qadīman wa ḥadīthan*. al-Majmaʻ al-ʻIlmī al-ʻIrāqī.

Karaman, B. (2025). Farabi's scientific methods and their reflections on modern history of science. *Journal of Human Sciences*, *22*(1), 1–8. https://doi.org/10.14687/jhs.v22i1.6544

Kasa, A. (2025). The Influence of Religious Beliefs on the Formation of Historical Events and Cultural Traditions: A Comparative Analysis of World Religions. *Pharos Journal of Theology*, (106.3). https://doi.org/10.46222/pharosjot.106.3027

Khalīlī, J. (1965). *Mawsūʻat al-ʻAtabāt al-Muqaddasah* (Vol. 12). Dār al-Taʻāruf.

Lav, D. (2025). Impaired Foundations, Perduring Law: The Meaning and Aims of Māwardī's al-Aḥkām al-sulṭāniyya. *Islamic Law and Society*, *32*(4), 341–381. https://doi.org/10.1163/15685195-bja10077

Le Strange, G. (2005). Baghdad during the Abbasid Caliphate: From contemporary Arabic and Persian sources. *Oxford University Press*. https://cir.nii.ac.jp/crid/1970867909862451130

Mahmoudian, S. (2025). *Palace Gardens in Lower Mesopotamia: 8th to 11th Centuries*. Edinburgh University Press. https://doi.org/10.1515/9781399524278

Māwardī, ʻAlī ibn Muḥammad. (1989). *Kitāb al-Aḥkām al-sulṭānīyah wa-al-wilāyat al-dīnīyah* (A. M. Baghdādī, Ed.; al-Ṭabʻah 1). Dār al-Wafāʼ; Maktabat Dār Ibn Quṭaybah.

Mohamed, N. Y. (2025). Towards a Contemporary Islamic Environmental Ethics: The Nature and Moral Status of Animals. *Journal of Islamic Ethics*, 1–34. https://doi.org/10.1163/24685542-20250009

Muhamad, A., Syihab, A. H., & Ibrahim, A. H. (2020). Preserving Human–Nature's Interaction for Sustainability: Quran and Sunnah Perspective. *Science and Engineering Ethics*, *26*(2), 1053–1066. https://doi.org/10.1007/s11948-020-00192-7

Muḥammad ibn Aḥmad ibn Abī Bakr Al-Qurṭubī. (2003). *Al-Jāmiʿ li-Aḥkām al-Qurʾān: Juz 11* (Hishām Samīr al-Bukhārī, Ed.). Riyadh: Dār ʿĀlam al-Kutub.

Muḥammad ibn Jarīr al-Ṭabarī. (2001). Jāmiʿ al-Bayān ʿan Taʾwīl Āy al-Qurʾān (ʿAbdullāh bin ʿAbd al-Muḥsin al-Turkī, Ed.). Cairo: Lil-ittibāʿati wan-Nashri wat-Tawzīʿi wal-Iʿlāni.

NASA Analysis Confirms 2023 as Warmest Year on Record—NASA. (2026). https://www.nasa.gov/news-release/nasa-analysis-confirms-2023-as-warmest-year-on-record/

Naṣr, Ḥusain. (1976). *Man and nature: The spiritual crisis of modern man*. Unwin Paperbacks.

Nur, A., Bin Husin, H., Alwizar, & Yasir, M. (2025). Qur'anic Ecotheology and the Ethics of Forest Protection in Indonesia. *Jurnal Studi Ilmu-Ilmu Al-Qur'an Dan Hadis*, *26*(2), 351–382. https://doi.org/10.14421/qh.v26i2.6312

Pordeus, M. P., Pordeus, C. L. V., Santos, V. H. H. D., Santos, M. D., Nogueira, G. I., & Fonteles, J. C. P. (2025). Climate Change and Human Activity: Global Challenge in Public Policy and the Cause-and-Effect Relationship in Natural Disasters Around the World Between 2020 and 2024. *Revista de Gestão Social e Ambiental*, *19*(7), e013004. https://doi.org/10.24857/rgsa.v19n7-116

Rāshid, S. bin ʿAbd al-ʿAzīz. (1986). *al-Rabadhah: Ṣūrah lil-ḥaḍārah al-Islāmīyah al-mubakkirah fī al-Mamlakah al-ʿArabīyah al-Saʿūdīyah* (al-Ṭabʿah 1). Kullīyāt al-Ādāb, Jāmiʿat al-Malik Saʿūd; Longman.

Rivera, D., Navarro, J., Camarero, I., Valera, J., Rivera-Obón, D.-J., & Obón, C. (2025). Persistence and Heritage from Medieval Bustān Gardens: Roses in Ancient Western Islamic Contexts and Abandoned Rural Gardens of Spain. *Heritage*, *8*(8), 315. https://doi.org/10.3390/heritage8080315

Robinson, C. F. (2001). A medieval Islamic city reconsidered: An interdisciplinary approach to Samarra. *Oxford University Press*. https://cir.nii.ac.jp/crid/1130000795109752704

Romdlony, M. Z., Darmawan, D., Anwar, R., & Rahman, M. T. (2025). Tawḥīdī Epistemology: Uniting Rationality, Empiricism, and Transcendence within the Framework of Islamic Science. International Journal of Nusantara Islam, 13(2), 397–412. https://doi.org/10.15575/ijni.v13i2.47380

Rovere, A., Ryan, D. D., Vacchi, M., Dutton, A., Simms, A. R., & Murray-Wallace, C. V. (2023). The World Atlas of Last Interglacial Shorelines (version 1.0). Earth System Science Data, 15(1), 1–23. https://doi.org/10.5194/essd-15-1-2023

Sadr, S. K. (2016). Fiscal Policies in Early Islam. In S. K. Sadr,*The Economic System of the Early Islamic Period* (pp. 89–133). Palgrave Macmillan US. https://doi.org/10.1057/978-1-137-50733-4_5

Shabanov, Z. M., Elshad, G. Y., & Yusifov, E. (2025). Islamic Legal Perspectives on Climate Justice: Integrating Environmental Ethics and Economic Responsibility. *Journal of Islamic Law and Legal Studies*, *2*(2), 62–78. https://doi.org/10.70063/jills.v2i2.121

Shābushtī, A. al-H. A. (1951). *Kitāb al-Diyārāt* (G. Awād, Ed.). Baghdad: Al-Maarif Press.

Siregar, I., & Rangkuti, S. S. (2023a). ECO-SPIRITUAL BASED ON MAQA>S}ID AL-SHARI>'AH: The New Relationship of Man with the Environment. *Al-Tahrir: Jurnal Pemikiran Islam*, *23*(1), 83–102. https://doi.org/10.21154/altahrir.v23i1.5833

Siregar, I., & Rangkuti, S. S. (2023b). Universalism of Islamic Scholarly Tradition: New Directions for Islamic Studies. *Islam Transformatif: Journal of Islamic Studies*, *7*(2), 202. https://doi.org/10.30983/it.v7i2.8050

Susa, A. (1948). *Rayy Sāmarrāʾ fī ʿAhd al-Khilāfah al-ʿAbbāsiyyah*. Baghdad.

UNESCO. (2025). *Architecture, monuments and urbanism. Part I: Architectural influences along the Silk Roads*. UNESCO. https://doi.org/10.54678/JNRQ3162

Van Den Bent, J., & Brown, P. J. (2025). Constructing Hydraulic Infrastructure in the ʿAbbāsid and Ṭūlūnid Capitals: Water Conduits in Baghdad, Samarra and Cairo between the Eighth and Ninth Centuries. *Al-Masāq*, *37*(1), 126–145. https://doi.org/10.1080/09503110.2024.2435086

Weintrobe, S., & Zeavin, L. (2025). *With Climate in Mind: Psychoanalysts on Climate Breakdown* (1st ed.). Routledge. https://doi.org/10.4324/9781003634959

Westberg, J. (2025). Historical methods in educational research: Sources, contextualisation, periodisation and analysis. *Paedagogica Historica*, *61*(6), 994–1014. https://doi.org/10.1080/00309230.2025.2473704

White, S., Collet, D., Alcoberro, A., Barriendos, M., Brázdil, R., Castell, P., Chen, S., De Coning, C., Degroot, D., Dolák, L., Döring, S., Gorostiza, S., Kleemann, K., Krampe, F., Lin, K.-H., Maughan, N., Melo, N., Molloy, B., Ogilvie, A. E. J., … Zhang, D. (2025). Climate, peace, and conflict—past and present: Bridging insights from historical sciences and contemporary research. *Ambio*, *54*(5), 774–792. https://doi.org/10.1007/s13280-024-02109-1

Yāqūt al-Ḥamawī. (1977). *Muʿjam al-Buldān* (Vol. 2). Beirut: Dār Ṣādir.

Zainuddin, Amrullah, A. M. K., & Zuhriyah, I. A. (2025). The Challenges of Developing Islamic Education Curriculum and Strategies for Its Development in Facing Future Competency Demands. *Tafkir: Interdisciplinary Journal of Islamic Education*, *6*(1), 111–126. https://doi.org/10.31538/tijie.v6i1.1316