Research Paper

The Islamic Bio-ethic Paradigm of Local Genetic Resources Utilization: Navigating Innovation Protection through IPR in Indonesia

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Abstract

Indonesia, as a mega-biodiverse nation, faces a critical challenge in balancing the commercialization of local genetic resources with the preservation of biological integrity and communal rights. Traditional Intellectual Property Rights (IPR) frameworks often prioritize individualistic and monopolistic ownership, which can conflict with the communal and spiritual values held by Muslim-majority societies. This paper aims to explore the legal paradigm through the lens of Islamic bioethics. The study employs a document study using the *maqasid syariah* method with a philosophical approach. It analyzes primary legal materials, including Indonesia's Patent Law and the Nagoya Protocol, and synthesizes them with Islamic legal maxims and the framework of *Maqasid al-Sharia* (the objectives of Sharia). The study finds that an Islamic Bioethic paradigm shifts the focus from "absolute ownership" to "stewardship" (*Amanah*). In this view, genetic resources are considered *Mubahl* (public goods) that require a fair Access and Benefit Sharing (ABS) mechanism to prevent *Zulm* (injustice). The study proposes that innovation protection must be integrated with recognition of nature as a trust to prevent exploitative biopiracy. To conclude, using the three-way balance is the best way to understand and implement the Islamic bio-ethics. Allah SWT is the owner of the GR; therefore, individuals who are able to utilize the resources only have a right to a reward commensurate with the efforts that have been contributed to the GR utilization, not the ownership. Furthermore, the benefit of such GR management must be enjoyed by the community and bring goodness according to Sharia principles, especially *Maqasid al-Sharia.*

Keywords *Islamic Bio-ethics, Genetic Resources, Innovation Protection, Maqasid al-Sharia, Intellectual Property Rights*

INTRODUCTION

Indonesia is known as one of the world's 17 "mega-biodiversity" countries, a group of nations that harbor the majority of Earth's species and high numbers of endemic species. Located at the intersection of two major biogeographic realms—the Indo-Malayan and Australasian—Indonesia acts as a vital bridge for global biological distribution (BISAP 2025-2045; CBD Indonesia Country Profile; Lubis, 2009). The richness of Indonesian biodiversity, according to the Indonesia Biodiversity Strategy and Action Plan (IBSAP) 2025-2045 and the Convention on Biological Diversity (CBD), highlights its global ranking across various taxa as follows:

Table 1. Indonesia's Share of Global Biodiversity by Taxa Group

Taxa Group	World Percentage	Global Rank	Key Data (Approximate)
Mammals	12-15%	1st – 2nd	± 732 species

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Taxa Group	World Percentage	Global Rank	Key Data (Approximate)
Birds	17%	4th	± 1,723 species
Reptiles	16%	3rd – 4th	± 773 – 781 species
Flowering Plants	10%	4th -5th	± 31,000 species
Coral Reefs	10% - 14%	1st	± 596 species
Marine Fish	25%	1st	±3,429 species

Source: Convention on Biological Diversity (n.d.)

The potential of 12% of the world's biodiversity within Indonesia's borders needs to be developed carefully, including jamu, which is widely used as a traditional herbal medicine (Kementerian Kesehatan Republik Indonesia, 2025; Sholikhah, 2016; Elfahmi et al., 2014). One instrument that protects and utilizes resources simultaneously is the legal concept of Permanent Sovereignty over Natural Resources, which is crucial to introduce (Pambudy, 2024). The other issue is that the implementation of benefit sharing under the Nagoya Protocol also serves as a legal instrument for protecting innovation through local GR. At this stage, the GR protection system in the context of the Convention on Biological Diversity (CBD) and Intellectual Property Rights (IPR) overlaps (Universitas Gajah Mada, 2018; Lubis, 2009).

The regulations on the protection and utilization of SDGs currently in force in Indonesia are based on secular principles, which essentially provide absolute protection for those seeking to utilize them, based on John Locke's labor theory; and none yet specifically regulate the protection and utilization of the SDGs in question (Barizah, 2020; Lubis, 2009) The central problem, then, is normative tension between the secular-capitalist nature of Intellectual Property Right and the concept of the Tawhid of stewardship (*Istikhlaf*). Neither of these secular legal frameworks accounts for the Islamic Bio-ethic regarding 'ownership of life'. The impact is that the utilization of SDGs focuses solely on their economic value, which can be monopolized (temporarily), so that there is a difference in the objectives of utilizing SDGs from the principles of *Maqasid al-Shari'ah* (Rahman, 2025).

The current academic discourse focuses on state sovereignty and financial contracts, as articulated in the CBD and the Nagoya Protocol, compared with spiritual value and communal trust (*amanah*) within Islamic principles based on *Maqasid al-Shari'ah*. The 'missing link', then, is the absence of an operationalized framework that translates the Maqasid al-Shari'ah into specific policy metrics for evaluating 'ethical patentability' of local genetic resources (Antons, 2017). The current study is necessary because Indonesia's investment principles are based on halal requirements. The concept of halal also relates closely to the spiritual value of the SDG utilization process. This research provides theological justification for benefit sharing, framing it not only as a legal requirement but also as a religious obligation (*Haqq*).

LITERATURE REVIEW

The Islamic Bioethical paradigm is a framework that governs human interaction with life and nature, grounded in the relationship among the Creator (*Khaliq*), the creation (*makhluq*), and the steward (*khalifah*). In the context of genetic resources, it moves beyond mere utility to a moral responsibility as mentioned in Al-Qur'an, Surah Al-An'am, verse 165:

وَهُوَ الَّذِي جَعَلَكُمْ خَلَائِفَ الْأَرْضِ وَرَفَعَ بَعْضَكُمْ فَوْقَ بَعْضٍ دَرَجَاتٍ لِّيَبْلُوَكُمْ فِي مَا آتَاكُمْ إِنَّ رَبَّكَ سَرِيعُ الْعِقَابِ وَإِنَّهُ لَغَفُورٌ رَّحِيمٌ

Translation: "And it is He who has made you successors upon the earth and has raised some of you above others in degrees [of rank] that He may try you through what He has given you. Indeed, your Lord is swift in punishment, but indeed, He is Forgiving and Merciful,"

GR could be part of humans' testing that should be managed responsibly, preserved for the next generation, and guided by justice as Khalifah on earth. The role of khalifah entails responsibility toward the environment, society, and all living beings as a divine trust from Allah SWT, the Creator. Khalifah is accountable for their actions, so they must govern the world with justice and wisdom (Blok, 2024; Barney, 1991). Under this framework, Islamic bioethics is based on *tawhid* (unity of creation) as a fundamental principle and regards nature as a trust (*amanah*) from Allah SWT. This ethic becomes the foundational cornerstone of Islamic bioethics. Unlike secular bioethics, which often prioritizes individual autonomy, a *Tawhid* framework centers on the Sovereignty of Allah over all creation, including the human body. In this view, the human body is not "owned" by the individual but is held as a sacred trust (*Amanah*) from the Creator. The same principle of managing GR or biodiversity is also applied.

The Philosophical Approach: Allah is The Owner

The Qur'an, Al-Maidah Surah, states that Allah is the owner of the universe.

لِّلّٰهِ مُلْكُ السَّمٰوٰتِ وَالْاَرْضِ وَمَا فِيْهِنَّۗ وَهُوَ عَلٰى كُلِّ شَيْءٍ قَدِيْرٌ ﴿١٢٠﴾

"To Allah belongs the sovereignty of the heavens and the earth and whatever is within them..."

From an ontological perspective, the surah affirmed that humans do not own their lives; they do not have an absolute right to do whatever they wish with their lives and the environment surrounding them. They should follow the owner's guidelines, i.e., Allah SWT.

In Islamic philosophy, everything in the universe is "contingent" (*mumkin*), meaning it does not have to exist by itself. Biodiversity—the vast array of genes, species, and ecosystems—exists only because it is "lent" existence by Allah. Therefore, humans only have 'relative ownership', which means that humans only have 'legal' ownership of biodiversity, but Allah SWT holds primal ownership (Al-Mulk). Humans hold ownership as a debt to the Creator, Allah SWT. As a debt, humans should make a 'report' on such management and bear the consequences of the order or disorder in biodiversity management. Therefore, humans must respect the universe's balance system because the system's ontological integrity belongs to the Creator, not to the user (Wiraputra et al., 2025). To interpret the philosophy, Agriyanto (2017) describes the human approach to the economy and also biodiversity as follows:

1. Biodiversity should be sufficient to meet human needs
2. Human needs for biodiversity should be arranged
3. Consumption of biodiversity is restricted; avoid *mubazir*
4. Distribution of benefits from biodiversity utilization should be a proportional share with the community

Strengthen the ontology approach above, from the epistemology approach, Allah owns biodiversity because He himself informed in the holy Qur'an, as the 'absolute truth' (*Al-Haqq*), as mentioned in Surah Al Baqarah, verse 2:

ذٰلِكَ الْكِتٰبُ لَا رَيْبَۛ فِيْهِ هُدًى لِّلْمُتَّقِيْنَۙ ﴿٢﴾

"This is the Book, without doubt, a guidance for the believers."

لَهٗ مَا فِى السَّمٰوٰتِ وَمَا فِى الْاَرْضِ وَمَا بَيْنَهُمَا وَمَا تَحْتَ الثَّرٰى ۝٦

"To Him belongs whatever is in the heavens and whatever is on the earth and whatever is between them and whatever is under the soil" (Surah Ta-Ha 20:6).

In the sense of biodiversity, studying it is seen as an act of "reading" the signs of the Owner. We "know" He is the owner because we recognize our own inability to create even "the wing of a fly" (Surah Al-Hajj 22:73).

To complete the approach, we shift from an axiological anthropocentric (human-centered) value system to a theocentric (God-centered) one. In this view, biodiversity has intrinsic value not merely because it is useful to humans, but because it belongs to the Creator.

Man as *Khalifah* approach: Trusteeship & Stewardship

Man as *Khalifah* is part of the *tawhid* principle, as a successive authority (QS 2:30). *Tawhid* dictates that because life is a gift from Allah SWT, all human lives are equal in value and sanctity (QS 5: 32). These verses provide the basis for the "Duty to Rescue" and the prohibition of murder and environmental destruction.

Further, the bio-ethics is well explained in the principle of public interest (*mislahah mursalah*) and preventing harm (*dar' al-mafasid*). In terms of terminology, *mislahah mursalah* means goodness that has no specific reason to reject or support it specifically, but is in line with the goals of sharia. (*maqasid syariah*). This principle enables Islamic law to remain relevant and adaptive to modern issues (technological, economic, and social) that are not regulated in detail in classical texts. In the context of biodiversity, its use could be consistent with the duties of the khalifah, whose primary task is to uphold the *maqasid syariah* (Asman & Aamer, 2025). The other principle of bio-ethics, in terms of man as *khalifah*, is transitioning from "private or individual rights" to "sovereign/communal rights" over GR as described in the following Hadiths:

"Muslims are partners in three things: water, pasture, and fire." (Sunan Abi Dawud)

In Islamic law (Fiqh) and ethics, the concept of communal rights over genetic resources is rooted in the belief that the fundamental building blocks of life are a divine gift intended for the benefit of all living beings. The concept is similar to the concept of 'common heritage of mankind' in Roman literature (Lubis, 2009). A significant difference arises when such natural resources are developed as inventions: they become intellectual property rights, which provide individual protection, whereas the Islamic perspective emphasizes Public Ownership (*Al-Milkiyyah al-'Ammah*) and Social Justice (Khaidir, 2024). Another principle intertwined with the modern concept of GR management is benefit sharing. Unlike the modern concept that treats Access and Benefit Sharing (ABS) under the Nagoya Protocol solely from a logical perspective, Islam views the concept as integrated with a spiritual dimension.

From the discussion above, there are at least three Islamic bio-ethics from the perspective of trusteeship as a main task of man as khalifah (Khasani, 2025):

1. *Maslahah Mursalah*: if privatizing innovation of GR hurts the public (e.g., making medicine unaffordable), the state must intervene to protect communal rights;
2. *Ihsan* (excellence): scientists should be rewarded for their effort, but they do not 'own' the creation;

3. *Hima* (protected zone): The community has the right to set aside "*Hima*" (protected areas) to preserve genetic diversity for future generations.

RESEARCH METHOD

This study employs a document study using the *maqasid al-sharia* analysis. Document study is a systematic procedure for reviewing or evaluating documents—both printed and electronic — as "social facts" produced, shared, and used in socially organized ways. According to Imam Al-Shatibi, there are three steps in doing the research:

Step 1: Collecting documents, including Nash Al Qur'an, regulations, journals, and other relevant literature.

Step 2: Identifying the cause, exploring the argumentation why the notion was written.

Step 3: Categorizing the document's clauses into the levels of necessity. Specifically, several of the documents studied were:

1. National Regulations:
   a. Law No. 65 of 2024 concerning the Third Amendment to Law No. 13 of 2016 concerning Patents
   b. Law No. 32 of 2024 concerning Amendments to Law No. 5 Of 1990 concerning Conservation of Living Natural Resources and Their Ecosystems.
2. International Conventions
   a. Law No. 5 of 1994 concerning the Ratification of the Convention on Biological Diversity (CBD)
   b. Law No. 11 of 2013 concerning the Ratification of the Nagoya Protocol
3. Islamic Literatures
   a. Al Qur'anul Karim, Ministry of Religion Translation Edition
   b. Fatwa MUI No. 4 of 2005 concerning IPR Protection
   c. Book and journals discussed *Maslahah Mursalah* in the context of science and property ownership (*Hifz al-Mal*) in the *Maqasid al-Shari'ah* perspective

In order to keep data validity, several documents were not included in this study (exclusion):

1. Double-counting data: Two documents provide the exact same data.
2. Low-reliability documents from anonymous sources, blogs, or platforms known for biased information.

All data were analyzed qualitatively, with emphasis on interpretation, understanding, and logical reasoning regarding relevant norms and ethics.

FINDINGS AND DISCUSSION

In Islam, ownership of the heavens, the earth, and everything between them lies with Allah SWT, which is regarded as the primary "Grand Norm" from which all secondary property rights derive. Allah is the Ultimate Sovereign *(Al-Malik)*. Unlike secular legal systems, where the State or the individual is the final arbiter of property, Islamic law posits that the "Title Deed" of the entire universe remains with the Creator (Surah Al-Ma'idah 5:120). Therefore, no human legislation can permanently override Divine prohibitions on the use of resources (e.g., environmental destruction).

However, this absolute ownership is then entrusted to humans as caliphs on earth, tasked with managing the heavens and earth and all their contents according to the will of the absolute owner. Humans possess what jurists call "Metaphorical Ownership." In a courtroom of Shari'ah, a person can claim "This is my land," but this right is legally categorized as a Trust (*Amanah*) (Surah Al-Hadid 57:7). Further, using legal maxims *"Al-Aslu fil-Amwal lil-Khaliq"* (The origin of all wealth belongs to the Creator), that in cases of doubt regarding property that has no owner (like deep-sea

minerals), the resource reverts to the public treasury (*Bayt al-Mal*) as it is God's property for the common good.

From a bioethical perspective, there is a paradigm shift in focus from "absolute ownership" to "stewardship" (*Amanah*) undertaken by humankind. In this view, genetic resources are considered *Mubahl* (public goods). The concept dictates that the benefits of biological discovery must serve the collective welfare of the *Ummah* (community) and humanity at large, rather than being confined to private or corporate monopolies (Idami, 2022). Applying this to genetic resources, the absolute patenting of a naturally occurring gene sequence—thereby preventing others from using it for life-saving research—can be seen as a form of biological *Ihtikar* (Barizah, 2020).

Summarizing the opinions expressed in the previous section, there are three main actors in SDG management from an Islamic perspective, namely Allah SWT, humans as caliphs, and communities or society. To clarify the relationship among the three as a basis for bioethics, the author proposes a three-way balance. The three-way balance is the best way to understand and implement the Islamic bio-ethics. Allah SWT is the owner of the GR; therefore, individuals who are able to utilize the resources only have a right to a reward commensurate with the efforts that have been contributed to the GR utilization, not the ownership (Shomad et.al., 2019). Further, the benefit of such GR management must be enjoyed by the community and bring goodness according to Sharia principles, especially *Maqasid al-Sharia* (Prayitno et.al., 2025).

Synthesis approach: The Three-Way Balance

Unlike Western bioethics, which often struggles with the tension between individual autonomy and state authority, the Islamic model introduces a synthesis approach called the three-way balance between the Creator, the community, and the individual or scientist in biodiversity management.

The First Pillar: Divine Sovereignty (Al-Hakimiyyah)

At the apex of this balance is the principle that Allah is the primary source of life and the ultimate owner of all biological matter. This pillar provides the moral boundaries (the "red lines") that neither the individual nor the state can cross (QS 5: 120). This justifies the prohibition of certain practices like euthanasia or "playing God" through harmful genetic manipulation, as these infringe upon the Owner's rights. Indonesia currently enshrines this principle in law: 'No Patent for Life' (Lenoir, 2003).

The Second Pillar: Communal Interest (Al-Maslahah al-'Ammah)

The community has a right to the benefits of biological and medical advancements. This pillar ensures that bioethics serves the common good and prevents the exploitation of life for private profit, under the legal maxim: *"The interests of the community take precedence over the interests of the individual"* (derived from Al-Shatibi's *Al-Muwafaqat*). This supports mandatory vaccinations, organ donation, and communal access to genetic resources. It prevents corporations from monopolizing life-saving treatments through excessive patenting. In recent IPR systems, there is a known obligatory license (Davies, 2022).

The Third Pillar: Individual Autonomy and Reward (Al-Karamah and Kasb)

The individual (whether as a patient or a scientist) is recognized as a "Vicegerent" (*Khalifah*) who has dignity, rights over their own body, and a right to be rewarded for their intellectual labor (QS 17:70). This pillar ensures informed consent. A patient cannot be compelled into a medical trial "for the greater good" without their consent, because their individual dignity is a Divine gift. When a scientist creates an invention using GR that benefits society, they hold the right

to a Reward for Labor and Innovation (*Ujrah*), but not ownership.

The beauty of this synthesis is its dynamic equilibrium. If any of the pillars becomes too strong, the system becomes unethical (Al-Bar et.al., 2015; Sachedina, 2009):

- Too much individualism leads to the commodification of the body/knowledge (e.g., expensive medicine)
- Too much communalism leads to tyranny (e.g., forced medical experiments)
- Too much legalism (divine pillar) without considering human need (*Darurah*) leads to hardship

CONCLUSIONS

Modern GR bioethics has been developed over decades through numerous fora, resulting in several international conventions and protocols. The Convention on Biological Diversity (CBD) states that all biodiversity within member countries is the sovereign right of that country. This means it is up to the country to make use of its GR, including preventing other countries from utilizing the GR for any reason. The other bio-ethic that is accepted internationally is access and benefit sharing. The principle is that other countries should have prior informed consent to access the GR, and if there is a benefit of such utilization, the GR provider countries have the right of benefit sharing.

The approach is only one part of Islamic bioethics that emphasizes that a country should manage the GR in the best public interest. The essential difference between the modern bio-ethics and Islamic bio-ethics is spiritual values in Islamic bio-ethics. Using the three-way balance, explain the relation between Allah SWT as the owner of the universe, communal values that prevent the exploitation of life for private profit, and individuals who have a right of reward for their effort to make use of the GR for the benefit of society.

LIMITATIONS & FURTHER RESEARCH

This study faces two main limitations. First, scholarship on Islamic bioethics in genetic resource management remains relatively scarce, which narrows the available theoretical and comparative basis. Second, engaging primary Arabic philosophical texts requires advanced linguistic competence and specialist interpretive skills, which constrain the depth of textual analysis in the present work. To address these gaps, future work will include consultations with and interviews of relevant experts and stakeholders.

The study is also bound by its reliance on formal normative sources, such as regulations, fatwas, and international conventions. While these documents clarify official ethical positions, they may not capture the lived realities of scientists and indigenous communities in Indonesia or how such paradigms are practiced and perceived. A logical next step is to expand into empirical socio-legal research, using surveys and interviews to assess whether the proposed Islamic framework aligns with stakeholders' everyday practices and concerns.

Further research can be developed in at least two directions:

1. Synthetic Biology and the Definition of *Khalq* Allah; with the rise of synthetic biology, scientists are now designing genetic codes that do not exist in nature. The research question of the study will be at what point does human "innovation" (*Ihsan*) cross the boundary into prohibited "alteration of God's creation" (*Taghyir Khalq Allah*)?
2. Operationalizing "Benefit-Sharing" in the Global Market; while Islam emphasizes communal rights, there is a lack of concrete "*Shari'ah-compliant*" models for international trade. The research question of the study will be what a "Zakat-based" or "Waqf-based" model for genetic benefit-sharing would look like in a globalized economy.

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