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Protection of Indonesia's Genetic Resources and Traditional Knowledge (International and National Legal Perspectives)

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ABSTRACT

Indonesia, with its abundant biodiversity, has important genetic resources (GR) and traditional knowledge (TK) in various fields. A normative juridical approach is used in this study. This research highlights the legal protection of GR and TK to prevent biopiracy by examining the national and international legal frameworks, as well as the challenges faced. International instruments such as the CBD, Nagoya Protocol, and TRIPS, as well as national laws (Law No. 5 of 1990 and Law No. 13 of 2016), have not been fully effective due to mismatches in regulatory objectives and implementation outcomes. Challenges in their implementation require commitment, knowledge, and collaboration of all elements of the nation. Regulations on the utilization of genetic resources and traditional knowledge have been regulated in several international and national legal sources. However, these regulations have not been able to protect the utilization of Indonesia's genetic resources and traditional knowledge from biopiracy and prevent the illegitimate granting of patents. This is because the basis of protection of genetic resources and traditional knowledge at the beginning was more focused on conservation without concerning at private aspects, especially commercialization. Therefore, the separate arrangements are needed in the use of genetic resources and traditional knowledge. In addition, the technical derivative regulations are also needed to address on the root of the problem in protecting Indonesia's genetic resources.

1. Introduction

Indonesia has signed the WIPO Treaty on Intellectual Property, Genetic Resources and Associated Traditional Knowledge (Treaty on GRATK) last July. This is certainly very useful in protecting Indonesia's genetic resources and traditional knowledge. Indonesia is the most biodiverse country in marine resources and ranks second in terrestrial biodiversity. The purpose of the Treaty on GRATK is to protect countries that own genetic resources and traditional knowledge from theft, in this case related to the unauthorized use of genetic resources and traditional knowledge to produce inventions on patents. This Treaty regulates the obligation to disclose the country information for the use of genetic resources and traditional knowledge in patent application. This Step should be taken to prevent the unauthorized use of genetic resources or traditional knowledge without the permission of the country and or community of origin and to ensure the fair and equitable benefit sharing to the country or community. In other words, the patent system should help scientists, commercial companies, public sector research institutions and the general public to realize benefits while protecting the rights and interests of biodiversity-rich countries, innovators, indigenous peoples and communities.

Indonesia has also previously shown its commitment by ratifying the United Nations Convention on Biological Diversity (CBD), the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from Their Utilization and the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA). However, the legal regime governing genetic resources and traditional knowledge does not address the protection of its utilization for works, inventions, or the results of intellectual property. More precisely, the protection of genetic resources and traditional knowledge has not synergized with the protection of intellectual property.

In the IPR framework, legal scope IPR protection is also an obstacle in the fulfillment of rights, as regulated in TRIPs, which is one of the loopholes in the protection of intellectual property at this time. Where patent protection is only given in the territorial area of a country where registration is made. Meanwhile, registration is still an important part of getting protection. Thus, there has been a shift in the territorial scope of patent registration. The existence of regional powers makes patent registration possible within a regional or international scope, for example, the WIPO Patent Cooperation Treaty (PCT) allows inventors to seek multinational patent protection for new technologies relevant to the UN Sustainable Development Goals (SDGs). Meanwhile, the specific registration of genetic resources and traditional knowledge does not yet exist. Genetic resources and traditional knowledge are closely related in their utilization to patents.

World Intellectual Property (WIPO) as an international intellectual property organization, recognizes the importance of a clear regulation in the use of genetic resources and traditional knowledge which results to some intellectual property rights meetings and international agreements, including through the establishment of WIPO Fact-finding Missions (WIPO-FFMs) and the Declaration on the Rights of Indigenous Peoples.

Indonesia has regulated genetic resources and traditional knowledge in several laws. Genetic resources are regulated in Law no. 5 of 1994 concerning Conservation of Biological Resources which emphasizes the conservation of biodiversity and the principles of providing fair benefits. Then in Law Number 13 of 2016 concerning Patents which regulates the requirement to include the 'country of origin' information from the use of genetic resources and traditional knowledge in producing patents. Law Number 32 of 2009 concerning Environmental Protection and Management also recognizes the role of indigenous communities in managing and preserving biodiversity. It was prompted by several cases of theft of genetic resources (biopiracy), including: (1) Publication by foreign researchers without permission regarding the discovery of a new species of Giant Wasp (Megalara Garuda) which has high economic value, (2) Registration of patents for 9 (nine) a type of plant native to Indonesia by Shiseido, a Japanese cosmetics company (later patented), although the patent has now been revoked, (3) Theft of pitcher plants (Nephentes clipeata) in TWA Gunung Kelam, West Kalimantan by foreign researchers, and (4) Publication without permission of research results on amphibians and reptiles in Lore Lindu National Park, Central Sulawesi by foreign researchers, etc.[1]

In recent developments, amidst globalization and digital transformation, it is easier to access genetic resources and traditional knowledge, which are then used to produce inventions, works or new varieties. Many experts talk about access and benefits of sharing in the use of genetic resources and traditional knowledge and this is then accommodated in several international legal instruments related to indigenous people, such as in the CBD and Nagoya Protocol. Meanwhile, its implementation is still prioritizing the regulations of each country related to access and benefit sharing. Apart from that, the fair and equitable sharing cannot yet be implemented properly because there are contradicting interests (the interests of developed and developing countries).

[1] Yayasan Konservasi Alam Nusantara, https://www.ykan.or.id/id/publikasi/artikel/siaran-pers/keanegaraman-hayati-indonesia-untuk dunia/#:~:text=Indonesia%20menempati%20urutan%20kedua%20di,untuk%20keanekaragaman%20hayati%20di%20lautan.

This article aims to provide a comprehensive and critical study of the problem of protecting Indonesia's genetic resources and traditional knowledge and concern about the application of international law and national regulations. This article tries to explain how international law regulates and protects generic resources either within the framework of the CBD, the Nagoya Protocol or within the IPR framework. This includes assessing how the framework has been implemented and identify obstacles in the protection of genetic resources and traditional knowledge of Indonesia (in particular). Furthermore, this article emphasizes the harmonization of international regulations related (which have been ratified by Indonesia) and Indonesia national regulations.

2. Method

This research was conducted using a normative juridical method with a statutory regulatory approach. It main purpose is to provide suggestions and thoughts to the government regarding the protection of Indonesia's genetic resources and traditional knowledge.

3. Results and Discussion

3.1 International Regulations

In international level, various legal instruments have regulated the protection of genetic resources and traditional knowledge, including the Convention on Biological Diversity (CBD), the Nagoya Protocol on Access and Benefit Sharing (Nagoya Protocol), and the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA). Article 1 of the CBD states that the purpose of this convention is to protect biological resources and their utilization and fair distribution commonly referred to as Access and Benefit Sharing (ABS). Article 2 of the CBD authorizes the state to regulate the protection of biological resources. Then in Article 15, it is stated that the state has the authority to determine access to genetic resources. This convention is one of the legal umbrellas that protect genetic resources in the public context (conservation interests). However, the CBD has not regulated how the ABS mechanism should be implemented by countries. This then became the background for the establishment of the Nagoya Protocol. Article 5 of the Nagoya Protocol states that ABS benefits arising from the utilization of genetic resources and their subsequent application and commercialization must be shared fairly and equitably with the Party that provides the resources, namely the state. In addition, the article also relates to genetic resources derived from the traditional knowledge of indigenous peoples must also be considered (get benefits). However, the Nagoya Protocol also has ambiguities in terms of giving the state authority to regulate it, so that countries regulate it according to their respective interpretations. Moreover, the clarity of the ABS mechanism is not regulated in the Nagoya Protocol. In addition, the Nagoya Protocol emphasizes more on the responsibilities of countries providing genetic resources, while the obligations of user countries to access and benefit sharing are less emphasized. As a result, there is no binding international sanction mechanism against this misappropriation.

The Nagoya Protocol also stipulates that the implementation of ABS relies on tracking mechanism of genetic resources, which in practice is difficult due to technological limitations and coordination between countries. This increases the risk of misappropriation or biopiracy. Moreover, with current technological advances, genetic data is often available in digital format (digital sequence information), but the Nagoya Protocol has not clearly regulated this aspect. This creates a legal loophole that can be utilized by certain parties. In addition, developing countries, including Indonesia, face challenges in establishing legal, administrative and technical frameworks in accordance with the Nagoya Protocol. These resource limitations slow down the implementation of ABS in provider countries. Then related to traditional knowledge that is closely related to genetic

resources, the Nagoya Protocol does not comprehensively regulate the protection and integration of traditional knowledge in the ABS mechanism, especially in the context of indigenous peoples.

In addition, the Nagoya Protocol does not have a strong international law enforcement mechanism. The compliance of this rule is left entirely to member states, which often results to lack effectiveness of sanctions in order to prevent or address violations. This is a gap in the current protection of genetic resources and traditional knowledge. This is due to the basis of the Nagoya Protocol is the CBD which only concern about conservation of natural resources, not in private interests (in this case, commercialization or profit). The protection of traditional knowledge is regulated in the ITPGRFA. Article 9.2 (a) and (b) states that state parties have an obligation to protect relevant traditional knowledge in genetic resources from farmers (farmer's rights) and the right to fair sharing of benefits arising from the utilization of food and agricultural crop genetic resources. The ITPGRFA also contains arrangements related to the multilateral system in ABS. The multilateral system established is expected to balance the interests of all interested parties by creating an efficient, effective, and transparent system. The Multilateral System will be shared fairly and equitably through mechanisms of information exchange, access and transfer of technology and capacity building, and sharing of benefits arising from commercialization. Article 13.2b (iii) also states respect for ownership and intellectual property rights. The benefit sharing referred to in the ITPGRFA is not only in profit sharing but also in technology exchange/transfer. However, the limitations of the ITPGRFA is that it only provides protection for certain types of genetic resources and traditional knowledge (64 types contained in the ITPGRFA / agricultural crops and food security), and is not related to its commercial aspects. Moreover, similar to the CBD and the Nagoya Protocol, the protection in the ITPGRFA does not provide clear mechanisms and sanctions for the misappropriation of genetic resources and traditional knowledge.

In addition to the CBD, Nagoya Protocol and ITPGRFA, the protection of genetic resources and traditional knowledge is regulated in the Trade Related Aspect of Intellectual Property Rights (TRIPS). Article 27 paragraph (1) of TRIPS states that patents can be granted on any invention, both products and processes, in all fields of technology, provided that the invention is new, requires inventive steps, and is capable of being applied in industry. And in Article 27 paragraph (3), patents can be granted on genetic engineering. This allows the granting of patents that use genetic material. However, TRIPS does not regulate the rights of the country of origin of the genetic resources. In addition, patents resulting from traditional knowledge are not limited in TRIPS, this is certainly contrary to Article 8 (j) of the CBD which gives rights to indigenous peoples/owners of traditional knowledge. And TRIPS only provides protection to individuals in patents generated through the utilization of genetic resources and traditional knowledge, this is certainly not in line with the CBD and the Nagoya Protocol which regulates ABS and prior informed consent.

Based on those weaknesses, the World Intellectual Property Organization (WIPO) negotiations began to be directed at the use of genetic resources and traditional knowledge used to produce patents. The existence of the WIPO Treaty on Intellectual Property, Genetic Resources and Associated Traditional Knowledge (Treaty on GRATK) in 2024 provides an answer to the above weaknesses. The Treaty on GRATK aims to improve the effectiveness, transparency and quality of the patent system with respect to genetic resources and traditional knowledge associated with genetic resources, and prevent the illegitimate granting of patents on inventions that are not new or inventive with respect to genetic resources and traditional knowledge associated with genetic resources by requiring patent applicants to disclose information on the use of genetic resources and traditional knowledge used to produce patents.[2] The Treaty is expected to have a positive impact in providing protection to genetic resources and traditional knowledge especially for developing countries that are the owners of great biodiversity and traditional knowledge.

[2] Article 3 WIPO Treaty on Intellectual Property, Genetic Resources and Associated Traditional Knowledge (Treaty on GRATK).

3.2 National Regulations

1. Law Number 5 of 1990 concerning Conservation of Living Natural Resources and Ecosystems.

Based on Law Number 5 of 1990 concerning Conservation of Living Natural Resources and Ecosystems, the utilization of biological resources, including genetic resources, must be done sustainably and without damaging the balance of the ecosystem. This utilization includes aspects of research, development, and responsible use. Article 3 states that:

> *"Conservation of biological natural resources and their ecosystems aims to realize the realisation of the preservation of biological natural resources and the balance of their ecosystems so that it can better support efforts to improve community welfare and quality of human life".*

The principle of utilization is regulated in Article 5 and Article 8, which states that the conservation of biological natural resources and their ecosystems is carried out through the protection of life support systems, preservation of the diversity of species and ecosystems, and sustainable utilization. Utilization must consider sustainability, including in the use of genetic resources for biotechnology, agriculture, medicine, and scientific research. Related to respect for indigenous peoples is regulated in Articles 37 and 38, the utilization of genetic resources must take into account the rights of indigenous and local communities who have been protecting biodiversity for generations. Communities have the right to benefit from the genetic resources they protect, including in economic, social, and cultural contexts. But on the other hand, this regulation is still very general and does not specifically regulate genetic resources and traditional knowledge. In addition, it also only concerns about conservation without explaining further about access and benefit sharing

2. Indonesia ratified the CBD with Law Number 5 of 1994 and the Nagoya Protocol with Law Number 11 of 2013

The Convention on Biological Diversity (CBD) and the Nagoya Protocol establish key principles in the management of genetic resources and their benefit sharing (ABS). These principles also apply to Indonesia, which has rich biodiversity and genetic resources of economic and scientific value.

Article 15 of the CBD confirms that every country has full sovereignty over genetic resources within its jurisdiction. The state has the right to regulate access, use, and benefit sharing of the genetic resources. On the other hand, The Nagoya Protocol stipulates that access to Genetic Resources must be authorised through a mechanism; Prior Informed Consent (PIC) and Mutually Agreed Terms (MAT). Article 15 (7) of the CBD and the Nagoya Protocol require that benefits from the use of Genetic Resources should be equitably shared with the country of origin and local communities. These benefits can take the form of; financial benefits (royalties, licences, or revenues from Genetic Resources based products), technology transfer and local capacity building, and access to research and development results.

The CBD and Nagoya Protocol provide an international legal framework for Indonesia to manage Genetic Resources sovereignly and ensure the benefits are enjoyed by the country and local communities. The Convention on Biological Diversity (CBD) and the Nagoya Protocol aim to regulate access to genetic resources and their benefit sharing mechanisms (ABS). However, there are several weaknesses in protecting Indonesia's genetic resources, which are rich in biodiversity and often targeted for exploitation. For example; The CBD and Nagoya Protocol only regulate legal access to Genetic Resources, but have no mechanism to prevent biopiracy, many foreign companies are taking Indonesia's genetic resources without permission or without providing benefits to the country or local communities.

In addition, the weakness of the CBD and the Nagoya Protocol is also evident from its lack of integration with international patent systems, such as the TRIPS Agreement (WTO) and WIPO (World Intellectual Property Organisation). Moreover, there is no obligation for international patent

offices to verify whether a patent involves Genteic Resources from the country of origin without authorisation.

3. Law No. 13/2016 on Patents

Indonesia has regulated inventions derived from genetic resources and traditional knowledge.[3] However, the law has not made it mandatory for user of genetic resources and traditional knowledge to disclose their information and provide sanctions for violations. In addition, this law also does not regulate access and benefit sharing as an obligation for user to the state/community that owns genetic resources and traditional knowledge. As well as supervision over the use of genetic resources and traditional knowledge that produce IPR.

3.3 Biopiracy Cases in Indonesia

Indonesia is severely disadvantaged by biopiracy. The data below illustrates Indonesia's losses due to biopiracy that occurred from 2019 to 2022.

Table 1. Descriptive Statistics of Biopiracy Incidents (2019-2022)[4]

Year	Number of Cases	Predominant Targeted Resource	Estimated Economic Impact (USD)	Top Countries Affected
2019	52	Medicinal Plants	$1.8 million	India, Brazil
2020	54	Exotic Seeds	$2.0 million	Madagascar, Peru
2021	56	Medicinal Plants	$2.1 million	South Africa, Indonesia
2022	58	Exotic Fruits	$2.4 million	Colombia, Malaysia

Table 2. Trend Analysis and Predictive Model Output (2023-2025 Forecast)[5]

Year	Predicted Number of Cases	Predicted Economic Impact (USD)	Top Affected Regions	Top Countries Affected	Increase in Cases (%)	Economic Impact Increase (%)
2023	60	$2.6 million	Southeast Asia	Indonesia, Malaysia	3.4%	8.3%
2024	62	$2.8 million	South America	Brazil, Peru	3.3%	7.7%
2025	64	$3.0 million	Africa	Kenya, Madagascar	3.2%	7.1%
2026	67	$3.3 million	Southeast Asia	Philippines, Vietnam	4.7%	10.0%
2027	71	$3.7 million	South America	Colombia, Ecuador	6.0%	12.1%

The forecast model shows a significant growth in biopiracy cases and economic effect from 2023 to 2025. Biopiracy incidences are expected to rise from 60 in 2023 to 64 in 2025, according to the model. The economic effect is expected to grow from $2.6 million in 2023 to $3.0 million in 2025. This steady rise highlights biopiracy's growing threat to biodiversity and economy, especially in biologically rich places most prone to it.[6]

There are several cases and typologies of biopiracy that have occurred in Indonesia, including:

[3] Article 26 of Law Number 13 Year 2016 on Patents.

[4] Suhaba Nizar Nazem, at all, Addressing Inequities in Biopiracy and Biodiversity Through International Legal Frameworks, 2024, Journal of Ecohumanis, Volume: 3, No: 5, pp. 857;

[5] ibid;

[6] Ibid;

Table 3. Typology and examples of biopiracy cases in Indonesia [7]

Theft of Genetic Resources samples	The filing of IPR against traditional knowledge in Indonesia related to Genetic Resources	The use of Genetic Resources samples and information for publication without involving Indonesian parties and/or research permits	The use of Genetic Resources samples and information for commercial purposes without clear benefits for Indonesia
The theft of hundreds of organism samples from forests of West Kalimantan (Media Indonesia, 2019)	Shiseido's patent application case for medicinal plant products from Indonesia and its knowledge (Kompas, 1999)	Research on the differences in the spleen glands of the Bajo tribe and its effect on respiration efficiency (Rochmyaningsi h, 2018)	Case of bird flu vaccine obtained from patient blood samples in Indonesia (Sarah, 2019)
Theft of wasp samples for publication in Southeast Sulawesi (LIPI, 2012)	Registration of the brand 'Toarco Toraja' for Toraja coffee by a Japanese company, accompanied by a picture of a traditional Toraja house (Septiono, 2009)	DNA-barcoding project of millions of new species with Borneo locations without sampling (field barcoding) (Pennisi, 2019)	Discovery of active compound silvestrol from Aglaia plant from Borneo to overcome Corona virus (Muller, 2018)

This table describes some biopiracy cases of Indonesian genetic resources and traditional knowledge and the forms of biopiracy. This illustrates that Indonesia has great potential, but has not been able to properly protect its genetic resources and traditional knowledge. The forms of biopiracy carried out are the theft of GR and TK, registration of TK and Indonesian GR by other countries, unauthorized publication by researchers (so that it is used to produce something new) and commercialization usage.

3.4 Legal Challenges For Indonesia To Protect Genetic Resources And Traditional Knowladge

The protection of GR and TK in Indonesia faces a number of complex legal challenges. Indonesia as a largest biodiverse country has an obligation to safeguard its genetic resources and traditional knowledge, but there are various legal obstacles that require special attention. Here are some of the challenges;

[7] Yayasan KEHATI SITH ITB,2020, **Menyusun Cetak Biru Bioprospecting di Indonesia, ITB Press, Bandung, p. 30;**

1) Disharmonious between National and International Regulations. Indonesia is contracting party to several international agreements, such as the Convention on Biological Diversity (CBD) and the Nagoya Protocol on Access and Benefit Sharing (ABS). Nonetheless, harmonization of national laws with international obligations is still not fully implemented. The protection and utilization of genetic resources and traditional knowledge should be subject to clear and comprehensive regulations, not scattered in several laws. This is because each law certainly has different goals and different perspectives. Apart from that, the obstacle of not harmonizing applicable laws and regulations with international law is also an obstacle in realizing good, effective and fair protection. Thus, there is no comprehensive national law to effectively regulate the Access and Benefit Sharing (ABS) mechanism under the Nagoya Protocol. There are also no strict rules, both the obligation to disclose information and sanctions for violations. Apart from that, Indonesia does not yet have clear implementing regulations that regulate the technical use and distribution of access and benefit sharing.

2) The challenges of data collection of Indonesia's GR and TK. Data collection requires expertise, financial support and technology. These have not been met to protect Indonesian GR and TK.

   Indonesia as a country that has ratified the Nagoya Protocol by Law Number 11 of 2013 is certainly subject to the provisions of the protocol. Article 6 stipulates that the state must have an administrative system to ensure access and data collection of GR, including a fair and transparent benefit-sharing mechanism. In addition, Law Number 22 of 2019 on Sustainable Agricultural Cultivation System Article 12 paragraph (1) states that the Government is obliged to collect data and conserve Agricultural Genetic Resources in the form of a national database, which is also supported by local governments. Related to Law Number 5 of 1990 concerning the Conservation of Biological Natural Resources and Ecosystems, article 8 states the same thing, where the government is obliged to conduct inventory, research, and data collection on biodiversity which includes GR This is strengthened by Government Regulation Number 39 of 2021 concerning the Implementation of the Intellectual Property Sector, Article 57 paragraphs (1) and (2) which states that the State is responsible for collecting data on Genetic Resources in a national database managed by the Ministry of Law and Human Rights in collaboration with relevant Ministries/Institutions.

   Thus, data collection of genetic resources is an obligation of both central and local governments. This responsibility also applies to the collection of traditional knowledge. In addition, the technical rules regarding the collection and recording of Traditional Knowledge are clarified in the Minister of Law and Human Rights Regulation (Permenkumham) No. 13/2017 on the Registration of Traditional Knowledge and Traditional Cultural Expressions. The Ministry of Law and Human Rights is the main institution who responsible for the collection and registration of Traditional Knowledge in Indonesia. However, its implementation often involves cooperation with local governments, indigenous communities and research institutions.

   Financial constraints also pose a significant challenge. The process of surveying, documenting, and maintaining databases for GR and TK requires substantial funding. This includes costs for field research, compensation for local communities, database management, and the development of legal frameworks to ensure protection. Unfortunately, financial support from both the government and private sectors has been insufficient, limiting the scope and sustainability of data collection efforts.

   Another key challenge is the lack of advanced technology to support efficient data collection and management. Digital databases, genetic sequencing tools, and secure storage systems are essential for safeguarding information on Indonesia’s GR and TK. However, many institutions and local authorities lack access to these technological resources, making the process inefficient and prone to data loss or mismanagement.

3) The absence of recognition of indigenous peoples' rights, Indonesia has not yet regulated law of indigenous peoples

   A further legal challenge in Indonesia is the absence of specific laws that recognize and protect the rights of indigenous peoples. Although various regulations recognize the existence of indigenous peoples, Indonesia has yet to pass a specific Indigenous Peoples Law, leading to problems securing their rights, especially over land, natural resources and traditional knowledge. Without legal protection, TK and GR belonging to indigenous peoples are vulnerable to biopiracy and commercialization by foreign entities without fair and equitable benefit sharing

4) There is no clear regulation on the utilization of GR and TK by foreign researchers.

   Minister of Research, Technology and Higher Education Regulation (Permenristekdikti) No. 41/2018 on the Procedure for Research Permits for Foreign Researchers Foreign researchers wishing to conduct research in Indonesia, including GR and TK sampling, must obtain an official permit from the Ministry of Research, Technology and Higher Education. They must collaborate with Indonesian research institutions (e.g. LIPI/BRIN, universities, or other research institutions). Research related to biodiversity must obtain additional permits from the Ministry of Environment and Forestry (MoEF) and related ministries/agencies.

   Despite the aforementioned provisions, there is no centralised agency overseeing access to and utilization of GR and TK by foreign entities. Furthermore, research permits are often issued without strict oversight, allowing unauthorized collection and export of biodiversity samples.

5) Weak inter-agency coordination in Gr and TK protection. In this case, both the central government through the Director General of IPR and the local governments.

4. Conclusion

Regulations on the utilization of genetic resources and traditional knowledge have been regulated in several international and national legal sources. However, these regulations have not been able to protect the utilization of Indonesia's genetic resources and traditional knowledge from biopiracy and prevent the illegitimate granting of patents. This is because the basis of protection of genetic resources and traditional knowledge at the beginning was more focused on conservation without concerning at private aspects, especially commercialization. Therefore, the separate arrangements are needed in the use of genetic resources and traditional knowledge. In addition, the technical derivative regulations are also needed to address on the root of the problem in protecting Indonesia's genetic resources.

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