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Protection of Patent Rights in the Genetic Engineering Development to Support the Development of New Capital City of Indonesia

Febri Noor Hediati
Faculty of Law, Mulawarman University, Indonesia
febrinoorhediati@fh.unmul.ac.id

Abstract

This research is motivated by the existence of an area in the new capital city's support area that has a tropical rainy climate and abundant natural resources, including forest plants and black orchids with special habitats that have the potentials to generate commercial profits. The study's findings applied a normative juridical method with a statutory and conceptual approach to explain patent rights on genetic engineering. By developing genetic engineering to produce useful products, many local and foreign investors will later be attracted to the use of patents for genetically engineered products. It is expected that in the future, both local communities and foreign investors will think creatively about how to develop a genetic engineering science and register patent protection for the final product. Genetic engineering requires technical skills, agricultural knowledge, ecological knowledge, medical knowledge (including medicine and healing procedures), and knowledge of genetic resources, therefore, a separate institution is required to study, research, and develop the potentials of the new capital city's natural resources. The state can protect genetic engineering development by registering a patent. Aside from being the seat of government, it has the potential to be a source of assistance and support for the national economy, one of which is in the field of intellectual property rights, specifically patent rights.

KEYWORDS *Patent Rights, Genetic Engineering, New Capital City*

Introduction

In the current era of modernization, technology plays a crucial role in enhancing the quality of life, as it constantly adapts to new circumstances. Innovative, creative, and one-of-a-kind technologies are evolving with the times. It is a challenge for our nation to catch up with global technological advancements so that we do not fall behind developed nations.

In terms of human resources, Indonesia is not inferior to other developed nations when it comes to conducting research. However, it is unfortunate that there is still a lack of government support for Indonesian researchers who discover various types of technology, so that many of them export their inventions. Whereas a significant number of other nations take advantage of the invention technology of Indonesian first and even purchase patents for the technology.

Considering this event, the government should place a higher priority on human resource development, particularly in the capital city and its surroundings, which have a significant impact on the movement of the capital city by providing policies that are conducive to the development of research and give the highest level of recognition to citizens who have discovered new technology-based inventions in various fields that can be used for the benefit of the community, this country can be made more progressive.

There are indigenous species and other genetic resources in every nation. Indonesia is one of these countries because of the abundance of its genetic resources, which include all kinds of ecosystems and plant, animal, and microbial life[1] with the expectation that citizens will generate new inventors. Genetic engineering is the process of modifying the genes of an organism in order to enhance its characteristics.[2] This genetic engineering's

[1] Teng Berlianty, Kerta Patrika, Formulasi Pengaturan Disclosure requirements sumber daya genetik sebagai hak paten, Vol 39 No. 2, August, 2017, https : // ojs. Unud.ac.id/ index.php/kerthapatrika,page 1
[2] www. Kompasiana.com. accessed October 1, 2022

scope includes plants, medical procedures, and technology. The support area in the new capital city has an abundance of plant resources, such as forest plants and black orchids, which are native to East Kalimantan.

Because natural resources are widely available in Indonesia, there is great potential for the development of this technology here. Indonesia is an archipelagic nation comprised of more than 13,000,000 islands. Indonesia is situated along the trajectory of the biodiversity distribution of the Asian continent (Java Island, Kalimantan, and Sumatra), the Australian continent (Papua Island), and the Wallacea transitional area (Sulawesi Island, Maluku, NTT). Indonesia has a very high level of biodiversity despite occupying only 1.3% of the earth's surface. In the form of food, clothing, and shelter, biodiversity provides consumption value. As a source of carbohydrates, the Indonesian population consumes more than one hundred species of grain plants and tubers. A minimum of 100 species of legumes, 450 species of fruits, and 250 species of vegetables and mushrooms are also consumed, while 940 species of plants produce ingredients for traditional medicines that are widely used in the pharmaceutical industry. containing a high economic potential value.[3]

The technology of genetic engineering is one of the newest technologies currently being developed. There is great potential for the development of this technology in areas where Indonesia has abundant natural resources. There is hope for the development of the entire island of Kalimantan in terms of human resources, infrastructure, and technology as a result of the relocation of the nation's capital. In order for the island of Kalimantan to no longer be synonymous with environmentally destructive coal exploration mines. Numerous things in Kalimantan can be enhanced by genetic engineering technology. For instance, it can be used to study the evolution of plants, animals, treatment methods, and other natural elements found on the island of Kalimantan.

[3] Country profile Indonesia dalam Balai Kliring Keanekaragaman Hayati, http://bk.menlh.go.id/?module=pages&id=(profile) derived on 01 October 2022)

Innovative genetic engineering technology could lead to new inventions whose intellectual property rights can be protected by laws and rules if they are registered as patents. Because the invention that was made has economic value in the world of business and trade. It will be unfortunate that inventions made through arduous work do not get protection from the government and can be copied or claimed by irresponsible people. In addition, the Patent Law in Indonesia lacks clear rules about inventions related to genetic resources, which is a problem because, as time goes on, technology gets better and better. With a possible plan for genetic engineering development in the area around the new capital city in which, after a new invention came out, needed legal protection.

Based on the above description, the following major issues will be investigated: (1) How should existing genetic engineering be developed, or what potential in the new capital city and surrounding community should be explored again? (2) What are the government's efforts to provide legal protection for genetic product patents? (3) What are the effects of the advancement of science and technology in genetic engineering on the economic and human resource development of the new capital city?

Method

The research method is a way to solve problems or develop knowledge using the scientific method.[4] The research method used by the author is a normative juridical approach. Normative research is defined as research that examines various legal rules of a formal nature, such as laws and other regulations related to problems, as the object of study for this type of research is legislation and library materials[5]. The normative juridical approach is based on the provisions of the legislation (black letter law) and

[4] Efendi Jonaedi, 2018, Ibrahim Johnny, *Metode Penelitian Hukum Normatif dan Empiris*, Jakarta, Prenada Media, page 3
[5] Soerjono dan Abdurrahman, 2003 , Metode Penelitian Hukum, Jakarta : Rineka Cipta, page 57

the concept approach.[6] And the normative legal research method that examines the law from an internal perspective with legal norms as the object of research.[7]

According to Soerjono Soekanto, the normative juridical approach is legal research conducted by examining library materials or secondary data as a basis for research by conducting a search on regulations and literature related to the problem being studied.[8]

The data used in this study are secondary data, whereas the data used to address the issues raised in this article were derived from a literature study. The laws and regulations governing patents are the primary source of legal data. Secondary data consists of expert opinion doctrines written in legal books, the outcomes of legal research that can be used to explain primary legal materials. And secondary materials are obtained by reviewing books, literature, and papers as part of document studies. Then there is tertiary material, which can be obtained by searching data on the internet, as well as magazine and newspaper opinions.

The research is specified as descriptive-analytical because it will reveal the facts and analyze the existing legal phenomena at the current time.[9]

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Result and Discussions

Genetic Engineering Technology and Its Development in the Indonesia New Capital City

A. Definition and Scope of Genetic Resources

According to the WIPO, traditional knowledge is utilized as knowledge. In a community, technical knowledge and skills have been

[6] Zainuddin Ali, 2010, *Metode Penelitian Hukum*, Yogyakarta, Sinar Graphic, page 89
[7] Pasek, I Made, 2017, *Metode Penelitian Hukum Normatif Dalam Justifikasi Teori Hukum*, Jakarta, Prenada Media Group, Page 12
[8] Soerjono Soekanto and Sri Mamudji, 2001, *Penelitian Hukum Normatif (Suatu Tinjauan Singkat)*, Rajawali Press, Jakarta, Pages 13-14)
[9] Soerjono Soekanto, 1986, *Pengantar Peneltian Hukum*, Jakarta: UI Press, page 10

passed down from generation to generation. According to Minister of Law and Human Rights Regulation No. 13 of 2017 on Communal Intellectual Property Data, traditional knowledge is an intellectual work in the field of knowledge and technology that contains elements of traditional heritage and is produced, developed, and maintained by the community. The traditional knowledge is comprised of technical skills, craftmanship, agricultural knowledge, ecological knowledge, medical knowledge, including drugs and healing procedures, as well as knowledge pertaining to genetic resources and traditional handicraft-making skills.

Genetics is a branch of biology that studies genetic material about its structure, how it reproduces, how it works, how it changes and its recommendations.[10] Therefore, the concept of genetics itself is how traits are passed down to a wider range. Genetic engineering is the application of technology to the addition or modification of organisms' genetic material.[11] Thereby, this technology combines genes from various species, including those from agriculture, plantations, and animal husbandry.

The Article 2 of the International Treaty on Plant Genetic Resources for Food and Agriculture defines plant genetic resources for food and agriculture as genetic material derived from plants with actual or potential food and agricultural value. Genetic resources include not only plants and animals that can be utilized by humans, but also all living things that have the potential to provide economic value and genetic value.

Below are the types of genetic resources, such as:[12]

1) Plants

All of the genetic resources found in seeds, tissues, and other plant parts. For instance, red fruit, long jack, Curcuma zanorrhiza or Temu

[10] Elya Nusantari, 2015, *Genetika (Belajar Genetika dengan Mudah dan Komprehensif),* Yogyakarta: dee publish, page 2

[11] Derek Harvey, Kim Bryan, Trevor Day, 2019, *Genetika Terapan*, Bandung: PT. Pakar Raya, page 5

[12] Andriano Purba, 2017, *Perlindungan Sumber Daya Genetika Berdasarkan UU Nomor 13 Tahun 2016 Tentang Paten*, Thesis of the Faculty of Law, University of North Sumatra

Lawak, as well as other plant-related parts including leaf stems, plant bark, roots, and soil that are attached to plants.

2) Animals

All genetic resources found in tissues, other animal parts such as eggs, embryos in animals that live on land and sea (including birds), for example are genetic resources in Gembrong goats, Garut's sheep or Bali's cattle (saliva, sperm, etc.).

3) Microbes Microbial

Microbial genetic resources are genetic resources associated with micro-organisms or microbes, such as bacteria, archaea, viruses, protozoa, molds, yeasts, and related materials, and/or containing microorganisms, such as palm wine, tempeh, blood curd, *brem* which is a solid cake and beverage made of fermented glutinous rice, fermented food, rice field snake feces used as rat poison, soil, mud

In accordance with Article 26 of Law 13 of 2016 on Patents, if an invention is derived from genetic resources, the origin of the genetic resources must be clearly stated in the invention's description. The utilization of genetic resources adheres to statutory regulations and international agreements in the field of genetic resources. According to Government Regulation No. 21 of 2005, genetically engineered products have a new genetic makeup as a result of modern biotechnology. Plant biotechnology cannot be separated from plant breeding techniques such as conventional/traditional crossbreeding and modern biotechnology techniques such as genetic engineering of plant tissue culture. Therefore, there are benefits of genetically modified plants, namely improved plant quality that confers resistance to pests and diseases.

B. The Government's Efforts to Develop Patent Rights on Genetically Engineered Technology in the New Capital City of Indonesia

Patent rights are a type of intellectual property rights regime classification. According to Law Number 13 of 2016, patent rights are "exclusive rights granted by the State to inventors for their inventions in the field of technology for a certain period of time to carry out the invention themselves or to grant permission to other parties to implement them." As a result, the patent itself is an intangible movable object. According to Article 503 of the Civil Code, each object is both bodily and non-bodily.[13] Because of the nature of patent rights, they can be transferred to others and are guaranteed fiduciary. Furthermore, patent rights can be transferred through license agreements, endowments, grants, and inheritance.

In terms of stimulating and enhancing economic growth and technological advancement, patents play a crucial role. It is as if everyone in the community can enjoy patent-protected technological works thanks to the innovations that have been brought to the industry. The work must be registered immediately to the Directorate General of Intellectual Property Rights if the creators want to secure exclusive rights to the creation. To ensure legal protection in the future.

Legal protection has its own purpose so that later entrepreneurs will compete to improve their innovation work, create jobs in the technology industry, create a conducive atmosphere for healthy business competition and improve people's welfare. As in the case of genetically engineered products, innovation technology must be registered to receive legal protection. Therefore, it is highly anticipated that the government will make efforts to protect patents through the Directorate General of Intellectual Property by mapping patent potentials arising from new inventions based on engineering technology. Therefore, cooperation between the Directorate General of Intellectual Property and research institutions is required to minimize legal consequences and losses that may arise in the future if there is a problem with the patent rights of a genetically engineered product that

[13] Subekti dan Tjiprosudibio, 2003, *Kitab Perundang-Undang Hukum Perdata*, Jakarta, Pradnya Paramita, page 157

creates legal and justification problems, particularly in the new capital city area and its surroundings.

Genetic engineering technology has enormous potential if it is developed on the island of Borneo. Moreover, Indonesia is known as one of the richest sources of biodiversity, which is derived from abundant natural resources, one of which is forest plants and black orchid plants which are the characteristics of East Kalimantan. The government's role here is also important, it is useless if there are abundant biological natural resources, especially in East Kalimantan, but the government does not have awareness. Strengthening awareness can be carried out by providing literate understandings of Intellectual Property Rights, science and technology development, especially in genetic engineering technology.

Recent changes in technology have led to changes in lifestyle and healthy eating habits, so the government must support a healthy lifestyle with all-herbal foods and medicines. The right use of these natural resources is needed to come up with new ideas in genetic engineering technology. Also, the issue of digital engineering is growing quickly, but it has not been supported by the issue of the legal status of genetic engineering. Most people still think that genetic engineering is in the public domain. The future of genetic engineering looks good and interesting, so it could be a big opportunity for people in the area around the new capital city of Indonesia.

As a result, the local government that supports the New State Capital region began working with the LIPI Biotechnology Research Center (Puslit) to develop innovative patent technology inventions in genetic engineering. Plant biotechnology refers to a branch of biology that studies the use of living things, either animals or plants.

On the other hand, there are obstacles that must be overcome by the government, including numerous issues related to climate change, the high intensity of natural disasters in East Kalimantan such as floods, damage and decreased carrying capacity of the environment itself, and outbreaks of infectious diseases among humans, animals, and plants. The government

must anticipate these challenges in order to minimize the problems associated with supporting innovation in genetic engineering technology by modifying the policy structure so that it is good and appropriate for its portion or objective.

Legal Protection of Patent Rights on Genetic Products

A. Subjects and Objects of Patent

Patent rights are one of the intellectual property rights contained in various other intellectual property rights regimes. Whereas in this right, the state provides legal protection to inventors for the results of their hard work on technological inventions. The inventor is the subject of the patent. The inventor can be a single person, a group of people, or a legal entity. Inventors create inventions by putting their innovative ideas into the form of technology.

Inventions are creative ideas materialized in the form of the inventor's work. These inventions can be created by the inventors themselves, or they can be transferred to someone else. The transfer of inventions in accordance with Law No. 13 of 2016 pertaining to patents, including inheritance, grants, wills, endowments, written agreements and other reasons justified under the provisions of the law. The object of the patent itself is an intangible movable object on intellectual property rights.

This patent is extremely important because it is required to process raw materials, which are then reprocessed into industrial products with a high market value or selling power. The industry includes industrial technology in the fields of agriculture, livestock, and education.[14]

[14] Abdul Kadir Muhammad, 2000, Hukum Ekonomi Hak Kekayaan Intelektual, Bandung: PT. Citra Aditya Bakti, Page 206

B. Patent Rights on Genetically Engineered Technology Products

Along with the development of technology, particularly in the use of living creatures created by Allah SWT, specifically plants that are used as media or invention tools. In addition to technology that is constantly evolving, there is also biotechnology that develops to engineer by modifying specific genes as well as in modified plant products to confer advantages or characteristics over similar plants. For instance, cabbage plants that have undergone a relatively lengthy maturation process prior to being harvested, so that the cabbage plant has its own distinguishing characteristics among other cabbage plants.

In compliance with Article 109 of Law No. 13 of 2016 on Patents, the Indonesian government can implement patents on its own, one of which is based on the consideration of a very urgent need for the benefit of the community and is limited and non-commercial in nature. The purpose of the urgent need is to benefit the community, as in the medical and agricultural fields.

In the implementation of Patent rights by the government, the following are included: expensive pharmaceutical/biotechnology products, chemical products or biotechnology related to agriculture that are required for food security, veterinary drugs required to combat widespread animal pests/diseases, and processes or products to deal with natural disaster/environmental disaster. Article 6 of the International Treaty on Plant Genetic Resources for Food and Agriculture outlines the steps involved in utilizing plant genetic resources for food and agriculture, such as:

1) Strive for equitable agricultural policies that, where applicable, promote the development and maintenance of diverse agricultural systems that encourage the sustainable use of agricultural biodiversity and other natural resources.

2) Enhance and preserve biodiversity by increasing diversity within and between species for the benefit of farmers, particularly those who produce and use their own varieties and apply ecological principles for maintaining soil fertility and controlling weeds and diseases.
3) Encouraging plant breeding with farmer participation, particularly in developing nations, thereby enhancing the capacity to develop varieties, especially those adapted to social, economic, and ecological conditions, including in marginal areas.
4) Expanding the genetic foundation of crops and increasing the genetic diversity available to farmers.
5) Increase the number of users of underutilized locally adapted and locally adapted plants, varieties, and species.
6) Encouraging the expansion of the use of diverse varieties and species in the management of attached land, the conservation and sustainable use of plants, and the establishment of close ties between plant breeding and agricultural development to reduce crop vulnerability and genetic erosion and to promote increased global food production in accordance with sustainable development.
7) Adjust breeding strategies and regulations pertaining to variety release and seed distribution.

To prevent the extinction of the unique flora of East Kalimantan, specifically the black orchids, genetic engineering techniques are required. In addition, there is a large forest area, which can be used to stimulate forest plant productivity through forest restoration. However, there are obstacles to the development of genetic engineering of forest plants, one of which is the lack of knowledge about the molecular aspects of growth properties and wood quality.[15]

[15] Anto Rimbawanto, Rekayasa Genetika tanaman Kehutanan di Indonesia : Potensi dan tantangan, Jurnal analisis kebijakan Kehutanan Vol. 3 Nomor 1 , Maret 2006, page 64

If the patent has been registered with the Directorate General for Intellectual Property Rights, it provides legal protection for the invention of crossbreeding plants using genetic engineering such as black orchids and wild forest plant. In order to obtain legal protection of patent rights, the following conditions must be met: 1) novelty, 2) inventive steps, and 3) industrial application. In addition to the state providing legal protection for the community against genetically engineered plantation products under the Patent Law, which is intended to recognize the discovery of genetic products in plantations, the community is also entitled to protection under the Consumer Protection Act.

Legally, a patent is protected if it has been registered and if there are regulations governing it, but there are no comprehensive regulations and derivative regulations regarding genetically modified plants. In addition to the Patent Law, the government should consider specific regulations and their derivatives for later genetically modified plants.

The Impact of Genetic Engineering Science Technology Development on the Growth of the New Capital City of Indonesia

In accordance with government regulatory policies and technological advancements in their application and practice, Intellectual Property Rights play an essential role in their utilization. In addition, legal protection is essential in today's global competition so that subsequent inventors can compete to develop new genetic engineering technologies. Genetic engineering is defined as the science of altering (modifying) the characteristics of organisms (living things) through the manipulation of genetic material, particularly DNA, and the transformation of specific genes to create new forms of life.[16] In East Kalimantan, tomato plant quality has

[16] Anton Apriyanto, 2007, *Potensi Ketidakhalalan Produk Pangan dan Masalah Pangan Hasil Rekayasa Genetika*, Bandung: PT. Dunia Pustaka Jaya

been started to improve through genetic engineering by delaying ripening and altering anthocyanin content. [17]

The rapid development of genetic engineering science and technology has subsequently permeated many fields, including medicine, pharmacy, agriculture, and animal husbandry. In genetic engineering technology, by combining the use of natural materials or abundant biological wealth in Indonesia, particularly in the East Kalimantan region, with the application of traditional technology-based knowledge, it is possible to produce new Intellectual Property Rights products, namely patent innovations.

Natural materials or biological wealth will be changed in different ways. One of these ways is by making transgenic organisms, which are made when the traits of one organism are changed to include those of another organism. Drugs and vaccines are pharmaceutical products, just like enzyme products. There are a lot of plants that make food ingredients whose genes have been changed to make natural food that is better and can last longer without getting eaten by pests. If in the health sector, care will be better and more advanced. If it is more efficient in agriculture and uses fewer chemical pesticides, it tends to use natural ingredients. If, in the field of animal husbandry, production technology can be used to raise the number of animals, this will improve the efficiency and quality of feed.

Below are the benefits obtained from genetic engineering methods, such as:[18]

1. Reduce costs and increase the supply of many materials now used in medicine, agriculture, and industry
2. Developing superior agricultural crops

[17] BPTP Kaltim www.Kaltim.litbangpertanian.go.id accessed October 1, 2022
[18] Sutarno, *Rekayasa Genetika dan Perkembangan Bioteknologi di Bidang Peternakan*, Proceeding Biology Education Conference vol 13 (1), 2016

3. Exchanging genes from one organism to another according to human wishes, induces cells to make materials that have never been made before.

With our ability to use genetic engineering methods supported by Indonesia, which inherits abundant biological and plant resources, it will affect the development of science in fields such as processed foods, beverages, and traditional medicines. Indonesians, particularly those in East Kalimantan, can benefit from the experience of other countries that are skilled at producing or processing plant and animal resources. In Brazil, for example, snake venom/venom is being processed into drugs to treat high blood pressure.

In terms of the direct impact of technological developments in the new capital city area, which serves as the economic center. The surrounding technological developments are significantly influenced. Which is still a relatively new technological area. It is hoped that by incorporating this new technology, residents living in the area surrounding the New State's capital will be automatically motivated to learn new things and increase their creativity in order to produce an innovation on patents.

Regarding the direct socio-cultural impact, with the introduction of new technology, the community's mindset will gradually become more open. Furthermore, the developed technology will have a significant impact on economic development, making the community more creative and innovative. The impact of increased competition in the world of technology is becoming more stringent. While the indirect effects include causing changes and shifts in lifestyle, as well as the creation of new values and procedures, namely local wisdom, which is the majority of the population surrounding the new state capital area, namely the Dayak and Kutai tribes.

Conclusion

The way to develop genetic engineering among the people of the new capital city of Indonesia is to issue patent innovations, particularly in genetic engineering. If genetic engineering technology is developed on the island of Borneo, it has enormous potential. In addition, Indonesia is renowned as one of the world's richest sources of biodiversity, because of its abundance of natural resources. One of them is black orchid plant and forest plant. Moreover, the government's role here is also crucial; it is pointless if East Kalimantan's natural resources are abundant, but the government does not have awareness. Through cooperation between the Government and the Research Center (Puslit) Biotechnology LIPI in the supporting areas of the new capital city. Government efforts to provide legal protection for patent rights on genetic products are intended to provide full support to the public by facilitating access to legal protection through the registration of intellectual property rights in the field of patents. The invention of crossbreeding plants through genetic engineering is protected by a patent. The rapid development of genetic engineering technology, which has since permeated various fields including medicine, pharmacy, agriculture, and animal husbandry, has had a significant impact on the economic and human resource development of a new capital city. By combining the use of natural materials or abundant biological wealth in Indonesia, particularly in the East Kalimantan region, with the application of traditional technology-based knowledge, it is possible to produce new Intellectual Property Rights products, namely innovations in the field of patents. By utilizing genetic engineering techniques supported by Indonesia, which possesses an abundance of biological and vegetable resources, it will affect the development of science in emerging fields such as processed foods, beverages, and traditional medicines. Furthermore, the black orchid plants were genetically engineered to prevent extinction, and

plant modifications such as tomatoes and forest plants were carried out for breeding.

The government pays more attention to the research and development of IPR products in the field of patents, especially genetic engineering from the research results of Indonesian children, so that the people of Indonesia can feel the benefits and impacts. The government fully supports the use of living creatures created by Allah S.W.T., specifically plants used as media or invention tools. As in the case of plant products that have been altered to possess advantageous or distinguishing qualities in comparison to similar plants. In addition, the government facilitates patent legal protection through the registration of intellectual property rights. The government must develop alternative regulations and specifications for genetically modified crops and genetic engineering inventions. With the development of genetic engineering technology, more competent and innovative innovations will be able to provide benefits to the surrounding community, particularly in the region surrounding the new capital city of Indonesia. In addition to providing community benefits, it can also contribute to the country's economic growth.

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