

PATENT PROTECTION FOR AGRICULTURAL TECHNOLOGICAL PRODUCTS AS AN EFFORT FOR THE ADVANCEMENT OF INDONESIAN AGRICULTURE

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Abstract

Patents are an important instrument in protecting innovation activities in the modern economy, especially in agriculture. Its systems foster increased innovation indirectly, by increasing the profit that can potentially be obtained from commercializing new technology. Seeing the development of agricultural technology that is growing rapidly, patent protection for agricultural equipment is very crucial. Therefore, this paper will examine and explain the impact of applying Article 20 of the Indonesian Patent Law, especially regarding the implementation of Patents in agriculture. This research is a type of library research that is juridical normative using the statute approach method. It is expected that this research able to contribute to the field of law, especially those related to Property Rights, especially regarding the study of issues related to the issue of patent ownership in agriculture.

Keywords: Intellectual Property, Patent, Agriculture

INTRODUCTION

Most agricultural innovation has been geographically concentrated. In 2019, five regions accounted for 77 percent of the granted patents worldwide: China (45 percent), the United States (11 percent), European Patent Organization member states, Russia, and South Korea (7 percent each).¹ While the United States holds the top spot in the relevance of innovation, China is expected to continue its dominance in the raw quantity of patents published. But, as one of the largest rice productions in the world, where is Indonesia in this regard? Why is the 'rich country' still not able to provide welfare for the state, for the Indonesian people, and for the farmers themselves?

As an agricultural country with plenty of natural resources, the potential of agriculture in Indonesia should be highly supportive. Indonesia lies on the equator with a tropical climate, an abundance of sufficient sunlight, an ideal humidity level, and people who love biodiversity, making Indonesia a country of glance for foreign countries, especially in the agricultural sector. In the current global era, agricultural technology is developing better, thus triggering several parties, such as the government and private companies, to be interested in developing this field. Agricultural technology is a tool and method used in processing agricultural inputs to produce farming outputs that are efficient and effective in the form of raw, semi-finished, or ready-to-use products.

In Indonesia, the development of agricultural technology, such as agricultural tools such as hoes, and sickles, has been developed for a very long time which at that time was very helpful for farmers' lives. Then, since the development of agricultural technology, slowly, simple, traditional agricultural technology is starting to be a bit abandoned because it is considered less productive and effective. The purpose of developing these technologies in agriculture is none other than to save human energy and to streamline the time of harvesting, planting, and others.

Agriculture is highly related to intellectual property and technology in one way or another. The optimal Intellectual Property use depends on the technology and the market environment. Within agriculture, Intellectual Property essentially consists of patents, plant variety rights (PVR), and trade secrets.² Trade secrets seem less suitable for protecting products sold on the open market due to the possibility of replication through reverse engineering.³ PVRs only protect new varieties, which meet certain conditions, as a whole, in specific territories, and during a defined time span. They do not protect specific plant characteristics ("traits").⁴ The patent system, on the other hand, protects specific innovative technologies and traits in exchange for the full public disclosure of the invention, which brings new scientific information into the public domain. This disclosure is important as it induces further improvements of prior innovations and additional innovations.

However, the need for patent protection of agricultural innovations is increasingly being questioned by civil society. Pressure is increasing to limit the scope of patent protection for agricultural innovations or to exclude the patentability of these innovations altogether. An important driver of this resistance is the fact that once a new technology exists (ex-post) a patent causes developers to set prices higher than under free competition.⁵ This is seen by many as allowing developers to extract (too much) profit at the expense of the consumer.⁶ But the innovation would

¹ Doruk Kaner, *Needle in a haystack: Patents that inspire agricultural innovation*, 2020, accessed through <https://www.mckinsey.com/industries/agriculture/our-insights/needle-in-a-haystack-patents-that-inspire-agricultural-innovation>.

² L. & POL'Y 23 (2000); Robert P. Merges, *As Many As Six Impossible Patents Before Breakfast: Property Rights for Business Concepts and Patent System Reform*, 14 BERKELEY TECH. L.J. 577 (1999); John R. Thomas, *Collusion and Collective Action in the Patent System: A Proposal for Patent Bounties*, 2001 U. ILL. L. REV. 305 (2001) (hereinafter *Bounties*); Simson Garfinkel, *Patently Absurd*, WIRED, July 1994, at 104; James Gleick, *Patently Absurd*, N.Y. TIMES, Mar. 12, 2000, § 6 (Magazine), at 44; Lawrence Lessig, *The Problem With Patents*, INDUSTRY STANDARD, Apr. 23, 1999, available at <http://www.thestandard.com/article/display/0,1151,4296,00.html>; Greg Ahronian, *Patenting the Internet, electronic commerce, bioinformatics*, at <http://www.bustpatents.com/index.html>; Jeff Bezos, *An Open Letter on the Subject of Patents*, <http://www.amazon.com/exec.obidos/subst/misc/patents.html>.

³ Asker, J., Stoeckel, A., *Intellectual property in agricultural trade*, June 1999

⁴ Spence Centennial Professor, McCombs Graduate School of Business, University of Texas at Austin.

⁵ Other drivers of resistance can be found, among others, at: Then, C. (Greenpeace), *Genetic engineering enforces corporate control of agriculture*, 2010

⁶ Bronwyn H. Hall and Rosemarie Ham Ziedonis, *The Patent Paradox Revisited: An Empirical Study of Patenting in the U.S. Semiconductor Industry, 1979-1995*, 32 RAND J. ECON. 101, 125 (2001)

likely not have existed without an incentive for the upfront (ex-ante) investment of the developer. In other words; a trade-off exists between the ex-ante and ex-post interest of society.

With the role of patents and agricultural technology, it is expected to be able to improve the quality of agricultural products, as well as make it easier for agricultural sector managers to obtain optimal work results. However, agricultural technology in some areas may still not be suitable to be applied as a whole, because patent issues for agricultural equipment still often occur, thus slowing down the performance of farmers. The long-term challenge for agriculture is daunting. Indonesia's population is expected to rise by 50 percent over the next half-century.⁷ The current agriculture patent system simply will not be able to feed the country. We will need another patent revolution to provide adequate food without seriously damaging the environment.

Therefore, this study becomes a necessity in the context of reforming national law in order to accommodate the dynamics of patent law as expected properly. This research investigates how Indonesia has responded to agricultural problems with the current regulations. With this research, it is hoped that the Indonesian government can increase the level of patent grants for farmers and improve the quality of agriculture at the same time. The objective of this research is to analyze the influence of Intellectual Property Rights, particularly the Patent Law, on the development of farming technology and current benefits for society.

RESEARCH METHOD

This study employs a descriptive research design and normative juridical legal research, or *library research*, methodology. Data from numerous legal works of literature, as well as relevant legislation and regulations, were gathered through a literature review. Qualitative analysis is the technique utilized for data analysis.

RESULTS AND DISCUSSION

It is indeed mentioned in the explanation of Law Number 13 of 2016 concerning Patents (Patent Law), that the revised approach to the Patent Law is aimed at optimizing the presence of the state in the best service of the government in the field of Intellectual Property; alignments with Indonesia's interests without violating international principles; realizing economic independence by moving the strategic sectors of the domestic economy by encouraging national inventions in technology to realize technological strengthening; and building the foundation of the National Patent through a systemic approach to pragmatic legal realism. But it should be noted that the benefit of the implementation of the Patent itself, apart from the economic, social aspects, also stimulates the growth of motivation to increase advanced technology and increasingly competitive competition, so that in addition to definite regulations, a more concise and efficient registration procedure is certainly desirable.

Meanwhile, to explore how the ability to benefit can be realized either for commercial purposes or to create competitive advantage, a number of disclosure strategies can be carried out, among others, by maintaining confidentiality, Patents and open science (scientific publications).¹⁶ Patent protection in Indonesia continues to adjust to the dynamics of domestic technological and industrial interests, even though it later feels forced when there are articles in Article 20 of the Patent Law. Article 20 of the Patent Law states: 1) Patent Holders are required to make products or use processes in Indonesia, and 2) Making a product or using the process referred to in paragraph (1) must support technology transfer, investment absorption and/or employment.

Patent holders are required to make products or use processes in Indonesia. This may happen if Indonesia has prepared everything to be conducive to the growth of domestic technology and industry, by deviating the provisions of TRIPs, in order to advance domestic technology growth. It is believed that the sentence should be: Patent Holders are required to use patented products or processes in Indonesia and in other countries where Patents are also registered. The sentence "Making a product or using the process as referred to in Paragraph (1) must support the transfer of technology, absorption of investment and/or providing employment". This reminds that in the era of 60-70, it was a well-known issue of technology transfer but then there was a tie in clause which forced

(discussing the royalty-free cross licensing between big patent holders that is common in the semiconductor industry and the use of patents as "bargaining chips"); Lemley, Rational Ignorance, *supra* note 7, at 1504-05; Kimberly A. Moore, Xenophobia in American Courts, 97 NW. U. L. REV. 1497 (forthcoming Summer 2003) (discussing defensive use of patents).

⁷ Professor of Law, Boalt Hall, University of California at Berkeley; of counsel, Keeker & Van Nest LLP.

companies operating licensing in Indonesia to use raw materials and experts/assistance from the licensor (foreign company).

Patents granted are prohibited from discrimination against the place of discovery in the field of technology whether the product is imported or produced locally. So the articles related to Article 4 (Patent subject eligibility), Article 20 (domestic manufacturing requirements), Article 78 (commercial license agreement for intellectual property rights) and Articles 82-120 (regarding compulsory licensing), need to be reexamined as to the effect Indonesia's technology and economy, as well as the interests of foreign investors which of course must bring benefits to Indonesia.

Article 2 on Patent Law (2016) regulates the protection of Patents which includes simple Patents and Patents. Patent protection requirements are still the same as the previous law (2001) which is new, contains inventive steps, and can be applied in industry.

Article 4 of Patent Law also states that the invention does not cover: a) aesthetic creations; b) scheme; c) rules and methods for carrying out activities: (1) involving mental activities; (2) the game; and (3) business.; d) rules and methods that only contain computer programs; e) presentation of information; and f) findings (discovery) in the form of: (1) new uses for existing and/or known products; and/or (2) new forms of existing compounds which do not produce significant increases in efficacy and there are known differences in the chemical structure of compounds.⁸

Rating of novelty according to the 'new' Qualifications based on Article 5, 2016 Patent Law, namely (1) the invention is considered new as referred to in Article 3 Paragraph (1) if on the Filing Date, the Invention is not the same as the technology previously disclosed; and (2) The technology disclosed previously as referred to in paragraph (1) is technology that has been announced in Indonesia or outside Indonesia in a written, oral description or through demonstration, use or other means that enables an expert to carry out the invention before Received Date; or the priority date in case the application is filed with Priority Rights; (3) The technology disclosed previously as referred to in paragraph (1) includes other Application documents submitted in Indonesia published on or after the Filing Date for which the substantive inspection is being carried out, but the Filing Date is earlier than the Filing Date or the priority date of the Request.⁹

Article 6 Paragraph (1) states that the Invention shall not be deemed announced if within a period of 6 (six) months prior to the Filing Date, the Invention has: a) displayed in an official exhibition or in an exhibition that is recognized as an official exhibition, both held in Indonesia and abroad; b) used in Indonesia or abroad by its Inventor in the context of an experiment for research and development purposes; and/or; c) announced by the Inventor in: (1) a scientific session in the form of examinations and/or stages of a thesis examination, thesis, dissertation, or other scientific work; and/or; (2) other scientific forums in the context of discussing research results in educational institutions or research institutions.

Article 6 Patent Law is also not considered to have been announced if within 12 (twelve) months prior to the Filing Date, there are other parties who announce by violating the obligation to maintain the confidentiality of the invention.

Regarding inventive step, Article 7 of Patent Law states that the invention contains inventive steps if the said invention for someone who has certain expertise in the field of engineering is unpredictable and to determine an invention is unpredictable as referred to in Paragraph (1) must be done by taking into account the expertise that was at the time the application was submitted or that was already available at the time the first application was filed in the case that the application was submitted with priority rights. Likewise regarding industrial applicable it is stated in Article 8 that the invention can be applied in industry if the invention can be implemented in industry as described in the application.

Article 9 of Patent Law also states that inventions which cannot be granted Patents include: a) a process or product whose announcement, use or implementation is contrary to statutory regulations, religion, public order or morality; b) the method of examination, treatment, treatment and/or surgery applied to humans and/or animals; c) theories and methods in the fields of science and mathematics; d) living things, except micro-organisms; or; e) biological processes that are essential for producing plants or animals, except non biological processes or microbiological processes.¹⁰

In order to accommodate the interests of protecting genetic resources/traditional knowledge, Article 26 of Patent Law states that if the invention relates to and/or comes from genetic resources

⁸ Duffy, J. F., & Hynes, R. (2016), *Statutory Domain and the Commercial Law of Intellectual Property*, Virginia Law Review, 102(1), p. 1. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2599074

⁹ Susanti, D.O. & Efendi, A. (2005). *Penelitian Hukum (Legal Research)(2nded.)*. Sinar Grafika, p. 23.

¹⁰ Gibbs, A. & DeMatteis, B. (2003). *Essentials of Patents*, John Wiley & Sons, Inc, p. 33-35

and/or traditional knowledge, it must be clearly and correctly stated the origin of genetic resources and/or knowledge mentioned in the description. Information about genetic resources and/or traditional knowledge is determined by official institutions recognized by the government. Likewise, it is explicitly stated that the sharing of results and/or access to the utilization of genetic resources and/or traditional knowledge shall be carried out in accordance with the laws and international agreements in the field of genetic resources and traditional knowledge. This is in accordance with efforts to embrace local wisdom, by providing support for the growth and development of intellectual property inherited from ancestors, synergized with government alignments through regulation and law enforcement. A helping hand from various parties both related institutions, NGOs and the campus is certainly expected.

Regarding the acquisition of Patent rights, legal subjects entitled to Patents based on Article 10 of Patent Law are as follows: (1) The party entitled to obtain a Patent is an Inventor or person who further receives the said inventor's rights; and (2) if the invention is produced jointly by several people, the right to the invention is jointly owned by the relevant inventors.¹¹

Furthermore Article 1, unless it is proven otherwise, the party considered as an inventor is a person or persons who are first stated as inventors in an Application. As is the case with the study of the doctrine of shop's right, Article 12 of Patent Law also holds that the Patent holder of an invention produced by an inventor in a work relationship is the party providing the work, unless otherwise agreed. This provision also applies to inventions produced, both by employees and workers who use data and/or facilities available in their work. It should be underlined that from now on it is clear and unequivocal, the inventor is entitled to receive compensation based on the agreement made by the employer and the Inventor, taking into account the economic benefits obtained from the said invention. The intended benefits can be paid based on: a) certain amount and all at once; b) percentage; c) a combination of a certain amount and all at once with prizes or bonuses; or d) other forms agreed by the parties.

Likewise, it was emphasized through Article 13 of Patent Law concerning who is entitled to a Patent in official relations and inventions in return to inventors related to their inventions after the invention is commercialized, as follows: (1) Patent holders of inventions produced by the inventor in official relations with government agencies are the said government agencies and inventors, unless otherwise agreed; (2) After a Patent has been commercialized, the inventor as referred to in Paragraph (1) has the right to obtain Rewards for the Patents that he produces from non-tax state revenue sources; (3) In the event that a government agency as a Patent Holder cannot implement his Patent, the inventor with the approval of the Patent Holder may implement the Patent with a third party; (4) With respect to the use of Patents as referred to in Paragraph (3), in addition to the Patent holder, the inventor receives royalties from third parties who obtain economic benefits from the commercialization of the Patent; (5) The provisions referred to in Paragraph (1) and Paragraph (2) do not nullify the right of the inventor to keep his name on the Patent certificate.

The importance of Patent in agriculture

The agriculture sector, undoubtedly, is one of the largest industries worldwide. The agriculture sector generates over \$2.4 trillion for the global economy.¹² Moreover, the global market size of smart agriculture is expected to hit \$23.14 billion by 2022.¹³ Today, the agriculture sector employs more than one billion people. The demand for agricultural products is rising at an expedited rate and is likely to grow as the world's population grows. The need to meet this global demand has fueled innovation in the sector. In other words, agricultural innovation is pivotal to feeding a growing global population of over 7.9 billion.¹⁴ Considering the fact that the global population is expected to rise by 50 percent in

¹¹ Gansetal. (2017), Contracting Over the Disclosure of Scientific Knowledge: Intellectual Property and Academic Publication. *Research Policy*, 46(4), p. 820. <https://doi.org/10.1016/j.respol.2017.02.005>

¹² Craig Hanson et al., Creating a sustainable food future: A menu of solutions to feed nearly 10 billion people by 2050, World Resources Institute, July 2019, wri.org.

¹³ The future of food and agriculture—Alternative pathways to 2050, Food and Agriculture Organization of the United Nations, 2018, fao.org.

¹⁴ Elizabeth Ainsworth et al., "Genetic strategies for improving crop yields," *Nature*, November 2019, Volume 575, pp. 109–18; "Science breakthroughs to advance food and agricultural research by 2030," National Academies of Sciences, Engineering, and Medicine, Washington, DC: The National Academies Press, 2019, nap.edu.

the coming century, innovative and novel methods to provide adequate food without damaging our ecological systems must be developed.¹⁵

Over the years, an increasing global population has led to the innovation of advanced tools to cultivate and harvest crops, genetically modified seeds that would resist plant diseases while providing improved nutrition, and other biotechnological systems that would ensure the safe cultivation of crops. Patents play an imperative role in protecting the intellectual inventions of scientists and inventors by providing them with an exclusive right. This exclusive right restricts unauthorized entities from copying, manufacturing, or selling an invention. Patents also boost the commercialization of a particular invention. Moreover, licensing the invention to third parties can also lead to financial benefits. Lastly, patents incentivize the creators behind an invention. Such incentives could include recognition as well as monetary benefits. Incentivizing inventors is pivotal since it encourages further innovation, research, and development. Patents have played an important role in the agriculture sector by protecting inventions such as genetically modified seeds, plant varieties, biocides, and biotechnological inventions. Typically, patents that are prevalent in the agriculture sector are referred to as 'agro patents'.

Advantages and disadvantages of patenting agricultural innovations

The patenting of agricultural inventions comes with both advantages as well as disadvantages. For one, the patenting of agricultural inventions can significantly impact the research and development stage of the technology life cycle. Through monetary incentives and recognition, scientists and innovators would be encouraged to further research on agricultural innovations that would help solve global issues related to food security. On the other hand, exclusive patent licensing of agricultural innovations has been severely criticized by many. This is essentially due to the fact that food security and other issues in the agriculture sector impact the global population and hence, restricting other countries from obtaining technologies that would facilitate and improve food security is considered to be unfair. Several studies have also highlighted that an exclusive patent licensing approach would result in certain producers having a "stronger incentive and grant them more market power". This can have dire consequences. For one, it may restrict farmers across the world from obtaining such patented technologies. The inability to obtain advanced agricultural technologies would result in reducing benefits to the farmers as well as the consumers. Pertaining to this, Mr. Willem Ruster, who manages the program of sustainability management in agriculture and food at the Wageningen Economic Research Centre notes that "an exclusive patent licensing approach would act as a stronger magnet for private-sector investment and increase the probability of innovation taking place,"

Agriculture and patents in the Indonesian context

Agricultural technology innovation plays an important role in increasing agricultural productivity, given that increasing production through land expansion is difficult to implement in Indonesia, amidst the widespread conversion of productive agricultural land to non-agriculture. According to data from the Central Statistics Agency in the period 1983-1993 there has been a land use change covering an area of 935,000 hectares, consisting of 425,000 hectares of paddy fields and another 510,000 hectares of non-rice fields or an average of 40,000 hectares per year.¹⁶

For the years 1993-2003, it is estimated that land conversion has doubled from 1983-1993, which is around 80,000 to 100,000 hectares per year. The largest land conversion areas occur in Java Island at 54% and Sumatra 38%. settlements/land (69 percent) and industrial areas 20%.

Ensuring food security, improving agricultural research, and fueling the development of new plant varieties have been an area of concern for the Indonesian government since time immemorial. Article 27.3 (b) of the TRIPS Agreement elucidates that plant varieties can be protected through patents or a sui generis system, or by a combination of both. Legislations such as the Protections of Plant Varieties and Farmers Rights Act have laid down frameworks to protect plant varieties without violating the rights of breeders, farmers, scientists, and workers in the agriculture sector. A study by the National Institute of Science Communication and Information Resources notes that over "250 patents were granted in the area of biocides, pest repellents and plant growth regulators, while rest of the areas accounted for 165 patents. Under this, 59 patents belonged to plant reproduction, new plants or processes for obtaining them, 25 patents in horticulture, cultivation, and forestry, 16 patents in animal husbandry, silk rearing or breeding animals, 14 patents in harvesting and moving followed by medicinal preparation containing materials from plants. 12 patents were awarded to soil works in agriculture or forestry, including agriculture machines or implements. 10 patents in planting, sowing

¹⁵ Other drivers of resistance can be found, among others, at: Then, C. (Greenpeace), Genetic engineering enforces corporate control of agriculture, 2010

¹⁶ Michelle Delio, *Software Writers Patently Enraged*, Wired News (Apr. 11, 2012)

fertilizing; 7 patents in catching, trapping, apparatus for destruction of noxious animals and 4 patents in the processing of harvested produce, devices for storing followed by the manufacture of dairy product patents were granted”.

Also, technology applied in the field of agriculture aims at improving the quality of agricultural outputs as well as minimizing inputs and wastages. This reduces both direct and indirect costs involved in agricultural production. There has been a steady growth in the number of people patenting technology in agriculture in recent years.

Amongst the various crops being grown and traded in the agricultural industry, the most popular are crops which are highly productive such as wheat, sugarcane, cotton, jute, pulses, citrus fruits etc. These plants are highly suitable for intensive and diversified farming systems which require consistent high yield monitoring.

Irrigation systems for these crops need to be highly automated to facilitate the timely application of fertilizers and pesticides. Thus, farmers depend on yield monitoring equipment for accurate prediction of the harvest level. Automatic timing and rescheduling systems are highly suitable for farmers with multiple crops growing on a single farm.

In addition, the concepts of agriculture technology and value chains have emerged to form a logical foundation for the development of small-scale, medium-scale and large-scale farmers all over the world. Large-scale farmers have a defined set of needs compared to the small-scale farmers who need a defined set of needs. As the agriculture industry grows, these defined points of requirement are converging with the evolving requirements of consumers, requiring agriculture products and services at a lower cost which are easily obtainable through farmers’ cooperatives and local marketing systems.

These convergence points are creating opportunities not only for large-scale farmers but also for the small-scale farmers who are leveraging their traditional assets to enter new markets. These farmers are reaping the benefits of agriculture technology that has reduced the cost and resource requirements associated with production processes and thereby enabling them to increase their sales and income.

Agricultural products and methods that are commonly patented on a global level, several types of methods and products that would increase efficiency in the agriculture sector have been patented. Inventions pertaining to planting, sowing, and fertilization are often granted with patents due to their novelty and industrial applicability. Inventions such as machines for washing and grading seeds, methods used for fertilization, preparation of in-situ compost, animal-driven agricultural apparatus, and sowing devices have been patented in the past. Moreover, inventions that improve and test the quality of the soil have also been patented. Such inventions include digital soil salinity testers, the process for manufacturing a slow-release urea fertilizer by nitrification inhibition, and the preparation of synergistic fertilizers from agricultural waste. Biotechnology plays a pivotal role in the development of seeds and plant varieties that are immune to climatic changes and pests. Often, genetically modified crops can also enhance food security in a particular country. Genetically modified crops are patentable. The biotechnology sector is largely research-driven. Hence, the patenting of genetically modified crops would also help fuel research and development. Research and development in the field of biotechnology are crucial for the creation of new plant varieties and seeds that are resistant to issues that negatively impact food security.

CONCLUSION

The study shows that IP rights play a critical role in enabling innovation in the agricultural sector. In a finite world with an ever-expanding population, agricultural innovation is vital in order to increase productivity and secure the global food supply. The benefits of modern technology adoption in agriculture can not be exhausted, there is increased crop productivity, reduced impact on natural ecosystems, increased worker safety, and decreased use of water, fertilizer, and pesticides among many others. However, in order to achieve these goals, farmers need to understand the concept of patenting and the use of technology.

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