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INTERNATIONAL PATENT LAW AND ITS IMPLEMENTATION IN INDONESIA: CAN IT FACILITATE TECHNOLOGY TRANSFER?

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ABSTRACT

Background and Purpose: Indonesia has patent law for more than three decades and has made adjustments with the Trade related of Intellectual Property Rights (TRIPs) Agreement by revising such patent law several times with the aim of encouraging innovation and technology transfer as promised by the Agreement, but technological capacity and technology transfer are still low. The purpose of this study is to analyse whether the implementation of international patent law in Indonesia facilitates innovation and technology transfer to increase technological capacity.

Methodology: This study used a normative legal research methodology. It used statutory and conceptual approaches. Both approaches were needed to analyse conceptual and theoretical works related to this topic and to examine consistency of applicable laws and policy. Legal resources and legal documents were analysed using descriptive qualitative analysis.

Findings: This study found that the implementation of international patent law to promote innovation and technology transfer in Indonesia was still not easy to be seen because the Indonesian Patent Law was not designed comprehensively to promote innovation and technology transfer and lack of consistency of regulations and policies on technology transfer. It also paid less attention to facilitate international technology transfer.

Contributions: This study suggests that Indonesia needs comprehensiveness and consistency of all prevailing laws and regulation related to technology transfer, research and development, particularly patent law, to fully use flexibility provided by the TRIPs Agreement to enhance national technological capacity and innovation.

Keywords: Indonesian Patent Law, innovation, International Patent Law, technology transfer, TRIPs Agreement.

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1.0 INTRODUCTION

The objective of international patent law as stipulated under Article 7 of the Trade related of Intellectual Property Rights (TRIPs) Agreement is to promote innovation, technology dissemination, and technology transfer and to acknowledge the balance between public and private interests for people's welfare. That objective is considered as a bargain for developing countries to accept standard of intellectual property rights (IPR) provided under the TRIPs Agreement, particularly patent law, and to implement a strong enforcement system at national level. TRIPs Agreement in its Article 66.2 clearly requires developed countries to give incentives to legal entities or agencies under their national jurisdiction to support innovation and technology transfer so that least developed countries have technological capacity.

Both Articles 7 and 66.2 are vitally important for establishing the link between protection of IPR and technology transfer and become driving force for developing countries to implement TRIPs standard and set up national law on IPR, including patent. On that basis, Indonesia has ratified the TRIPs Agreement in 1994 and revised its Patent Law several times to adjust with TRIPs standard so that this country was able to enhance technology transfer and innovation. Furthermore, the new Indonesian Patent Law of 2016 (Indonesian Patent Law) has been issued to accommodate new development of technology and to stimulate innovation for national development and public welfare as stipulated in the Preamble.

Since 1970s and early 1980s, IPR and transfer of technology have been a subject of concern at several workshops and seminars organized by the National Law Development Agency of Indonesia (*Badan Pembinaan Hukum Nasional*), although there was no clear definition of technology transfer at that moment (Antons, 2002). It means that Indonesia needs

international technology transfer to increase national competitiveness index (Ramadhan, 2017) and to build independent and resilient national industry for national development (Investor Daily, 2014). Technological innovation is very important, but access, adoption, and transfer of such technology become a challenge for Indonesia. For that purpose, Indonesia has issued some legislations and policies to foster technology transfer, for example, revision of IPR laws, Technology Transfer Regulation, National System for Research and Development Law, Bilateral Free Trade Agreement (BFTA), and many others.

However, technology transfer is still one of the most important issues, particularly if it is connected with IPR protection. Although Indonesia has ratified the TRIPs Agreement 25 years ago, statistic from Directorate General of Property Right of Indonesia shows that between 2017 and 2018, the number of national patent application was dramatically decreased from 2.842 to 1.720. That number was relatively low compared to the number of application filled by foreigners or foreign entities. Similarly, in 2019, national innovation index of Indonesia was ranked 85th out of 129 countries in the world. In the ASEAN region, Indonesia's innovation ranked in the second lowest position after Cambodia, while Singapore was in the first rank followed by Malaysia (Widowati, 2019). Since 2011 until 2018, the average value of Indonesia innovation was 29.8 points and it was very low compared to those of most developing countries (Dutta, Lanvin, & Wunsch-Vincent, 2018).

Based on the above background, this study becomes significantly important to analyse the link between the implementation of international patent law and innovation and technology transfer. The focus of this study is to comprehensively analyse whether existing patent system stimulates innovation and facilitates technology transfer in Indonesia. Furthermore, it analyses the consistency and sufficiency of prevailing laws and policy related to patent, innovation, and technology transfer. Such analyses are required to better understand the legal challenges and barrier of technology transfer in Indonesia from normative perspective and to ensure that such legislations and policies are supportive to technology transfer. Prior to this, literature review is needed to provide basic reference of the works that have been done in relation with this topic.

2.0 LITERATURE REVIEW

2.1 Definition of Technology Transfer under International Law

International law literatures related to technology transfer do not provide a generally accepted definition of technology transfer. Its scope is very wide, as it can refer to commercial and non-commercial processes, movement of both material and immaterial aspects such as know-how and specified capabilities within or across national jurisdiction (UNCTAD, 2014). The Draft

International Code of Conduct on the Transfer of Technology of 1985 defined it as the transfer of systematic knowledge for the manufacture of a product, for the application of a process, or for the rendering of a service, which does not extend to the mere sale or lease of goods (ICTSD, 2008). This Code provides a comprehensive definition of technology transfer because it specified a wide range of activities divided into five types of schemes, which can be deemed as technology transfer, covering provisions on sale and licensing of all forms of industrial property, know-how and technical expertise, technological knowledge for installation and turnkey projects, technological knowledge for use of machinery which have been acquired purchase or lease, and technological contents of industry and technical cooperation. However, the Code is not binding in nature, as the negotiation has not reached any conclusion. Consequently, international forum tends to take broader notions and developed countries also take their own approach. The Intergovernmental Panel on Climate Change, for instance, defined transfer technology in broader context (IPCC, 2000; Phelan, 2015).

Similarly, international IPR law under the TRIPs Agreement also does not explicitly provide definition of technology transfer, although this agreement is the most pivotal multilateral legal instrument regulating transfer technology (Shugurov, 2016). This agreement globally harmonized standard of IPR protection and its enforcement system which has a significant impact on technology transfer. Consequently, in the absence of definition of technology transfer under the TRIPs Agreement, each developed nation has set up its own definition and meaning of technology transfer in accordance with their own interest.

Switzerland, for example, defines technology transfer in broader context, including a board set of processes covering the flows of know-how, experience, and equipment amongst different stakeholders, such as governments, private sector entities, financial institutions, NGOs, and research/education institutions. This definition is slightly different from European Community, which interprets that sound and viable technological base does not depend solely on the provision of physical objects or equipment, but also on the acquisition of know-how, on management and production skills, on improved access to knowledge sources, as well as on adaptation to local economic and social and cultural conditions (IP/C/W/536/Add.7). Meanwhile, Japan interprets technology transfer to include variety of measures, such as financial support and support for business environment, and strengthening IPR protection is one of the effective means by private sectors to promote it (IP/C/W/551/Add3). Surprisingly, Australia states that technology transfer includes training, education, and knowledge (IP/C/W/536/Add.2).

The difference in definition and interpretation of technology transfer among developed countries makes it difficult to ascertain whether those countries have fulfilled their promises and commitment as stipulated in the Article 7 of the TRIPs Agreement.

2.2 TRIPs Agreement and Technology Transfer

There are a number of international laws dealing with technology transfer, especially IPR protection (UNCTAD, 2011). Some of them, such as in international trade law, are binding in nature, but many of them are non-binding, for example, soft international environmental law (Shugurova & Shugurov, 2015). This study specifically reviews the TRIPs Agreement rules as the most influential multilateral legal regime on technology transfer.

The TRIPs Agreement has specific provisions dealing with technology transfer. The main objective of this agreement, as stipulated under Article 7, also becomes the most important provision dealing with technology transfer. During the negotiation, developing countries were unsure whether strongest IPR protection could promote technology transfer (Shashikant & Khor, 2010). On that basis, this Article 7 provides an equilibrium principle between the interest of developed countries as the producers and the rights holders of technology and the interest of developing countries as users of technology and the public to have access to science and technology.

However, the wording of the Article 7 indicates that IPR protection does not always promote innovation and technology transfer and therefore, it should be implemented to ensure innovation and technology transfer (Shashikant & Khor, 2010). In accordance with that principle, TRIPs provides some flexibility to accommodate equilibrium principle through compulsory license, government use and parallel importation. All of them can be used as instrument to adopt new technologies in cheapest cost. Besides rules on license, TRIPs also requires disclosure requirement as stipulated in the Article 29 (1) and research exception to enhance dissemination of science and technology transfer.

The Article 8.2 of the TRIPs Agreement also recognized that rights holders have a potential to abuse IPRs that have a significant impact on technology transfer, so appropriate measures are needed. One of these measures is through antitrust law. This antitrust law is very important to ensure that licensing practices or conditions to obtain IPR do not have serious impacts on transfer and dissemination of technology as stipulated in Article 40.1. Therefore, national competition law can be used by developing countries to promote access to science and technology transfer (Nguyãěn, 2010). The TRIPs Agreement also provides examples of practice that can be regarded as inhibiting technology transfer as stipulated under Article 40.2.

Although TRIPs Agreement provides legal basis for technology transfer, such technology will not be automatically transferred without certain national measures for its implementation as stipulated under Article 66.2, which requires developed countries to provide incentives to companies and other legal entities in their national jurisdiction. However, TRIPs provide freedom to developed countries to provide certain type of incentives as long as it can support least developed countries to have technological capacity. However, the commitment of developed countries to comply with this Article is lack of satisfactory and accordingly, the effectiveness of this agreement to support technology transfer is in question. Such commitment has been then reaffirmed in the Doha Ministerial Conference that implementation of Article 66.1 is compulsory and then it is reinforced again in the Paragraph 7 of the Doha Declaration on TRIPs Agreement and Public Health. However, effectiveness of this Article 66.2 depends on willingness of developed countries in setting up the terms and conditions of such technology transfer.

2.3 Function of Intellectual Property for Technology Transfer

Scholars have different arguments on the function of IPR, particularly patent, in facilitating technology transfer. Eisenberg argued that in some aspects, patent plays crucial role, but on the other aspects it can inhibit technology transfer (Eisenberg, 1996). Similarly, according to Nagaoka, the impact of stronger patent protection on technology transfer can be positive and negative. If there is barrier in the imitation, it will be negative, but if it is incentive for licensor, the effect will be positive (Nagaoka, 2009). Inevitably, in developed countries, protection of IPR has crucial impact on accessibility and diffusion of technologies because they have an abundance of potential innovators and effective innovation structure and accordingly, they tend to provide the strongest IPR protection (Shugurov, 2016). Thus, strategies of IPR protection and its implementation have a significant impact on technology capacity in developed countries.

Meanwhile, in the case of developing countries, Hall, in his survey, has examined the link between strength of a country's patent protection and different types of technology transfer that enter into that country. Hall concluded that in mid-level developing countries, stronger patent protection promoted foreign direct investment (FDI) and technology transfer, and the evidence to promote local innovation was slight but obvious (Hall, 2014). However, Hall suggests that further research on this area is needed (Hall, 2014). Arora also advises that further research is required to investigate the gap of the impact of IPR on technology transfer to

developing countries although number of literatures on technology transfer has been increasing recently (Arora, 2009).

Some scholars also argue that patent promotes technology transfer. This argument is based on idea that patent has significant function as a storage house of technological invention and knowledge and through patent system, such technological invention and knowledge are disclosed to public during patent application. By such disclosure, it encourages new innovations and technology transfer (Shugurov, 2016). Furthermore, patent can also affect knowledge production and innovation speed through various means, such as exclusive right which encourages investment on research and innovation, disclosure requirement, market transactions, and licensing (Guellec & Pottelsberghe, 2007). With the increase of trade liberalization not only in goods and services, but also the flow of IPR products and processes including technology and knowledge, the relationship between patent and technology transfer has received a momentum to be nationally and internationally recognized as one of the most controversial issues. There are contradictory and ambiguous effects of IPR on technology transfer and accordingly, it needs international cooperation and development facilitation (Shugurov, 2016).

In the context of Indonesia, although this country has had a patent law thirty years ago, the number of national patent applications remains insignificant and has not increased. The DGIP statistics show that the number of patent applications and registered patents of nationals and foreigners is disproportionately uneven for three decade. Those statistics may indicate that there is a little evidence that the patent system encourages local innovation in Indonesia. Antons critically commented that this was due to the predominance of imported technologies, particularly in the mega projects of strategic industries (Antons, 2002). However, in most jurisdictions, foreign patents will be at least 90% and this is true even in developed country such as Australia, except in the US and Japan, which have around 50% of national patents. From this perspective, the composition between national and foreign patents in Indonesia is still categorized as normal. This condition suggests that although developing country like Indonesia provides patent protection, expecting the number of national patent to be more than 30% may be unrealistic.

3.0 METHODOLOGY

This study used normative or doctrinal legal research methodology. To answer the problem of this study, two approaches, which are conceptual and statute approaches, were used. In this normative legal study, conceptual approach was used to analyze and interpret existing

concepts, doctrines, or theories from different frame of reference to build a legal argumentation to answer the question of this study. There were two important concepts for this study, which were the concept of patent law and technology transfer and a doctrine that strong patent protection promotes technology transfer and innovation. Under this approach, doctrinal framework based on existing literature reviews on whether strong patent protection promotes or hinders technology transfer and innovation was also carefully analyzed, particularly in the context of developing country like Indonesia in which the number of foreign patented technology is higher than that of national patented technology. Statute approach is very important to analyze consistency of different type of prevailing law and regulation dealing with innovation, R&D, and technology transfer, to find philosophical grounds of the laws and policies. Meanwhile, legal resources that were used in this study were primary and secondary legal materials that were relevant to the background, problem, and result of this study. This primary legal material consisted of legal documents in the form of international law, such as treaties and protocols, and national law such as legislation and regulation that were relevant to this study. Secondary legal materials consisted of books on law related to this study, journal articles, and many others. All legal materials were compiled and selected in accordance with its relevance to this study and sub topic of discussion. After that, all those legal materials were then analyzed based on both statute and conceptual approaches above by using descriptive qualitative analysis.

4.0 ANALYSIS AND DISCUSSION

This part analyses the implementation of international patent law on technology transfer in Indonesia. It comprehensively analyses the consistency and sufficiency of prevailing laws and policies related patent, innovation, and technology transfer. This analysis is very important to understand the legal challenges of technology transfer in Indonesia.

4.1 Indonesian Patent Law and Technology Transfer related Provisions

The first patent law was introduced in Indonesia three decades ago. After this country's ratification to the TRIPs Agreement in 1994, the Patent Law was amended several times. The main reasons for such amendment were to adjust with new development of technology and to comply with the global TRIPs standard. Similar with other developing countries, Indonesia uses transfer technology as bargain to provide patent protection in accordance with the TRIPs standard. However, unfortunately, technology transfer has not been a major consideration in designing national patent law. This can be seen in the new Patent Act Number 13 of 2016 that

does not specifically mention the need to promote technology transfer. This is probably because Indonesia believes that the link between patent protection and technology transfer is still unclear, although some aspects of patent law have crucial impact on technology transfer. Accordingly, this part focuses on some aspects of Indonesia's Patent Law, which have a potential to support or inhibit technology transfer, license, disclosure, and research exception.

Indonesian Patent Law regulates license under Articles 76- 79. In principle, patents holders have a freedom to license out patented inventions in Indonesia as stipulated under Article 76. However, this license shall be registered and announced by the Ministry of Law and Human Rights to be able to be enforced (Article 79). Because this law does not regulate licenses on inventions patented outside Indonesia, contract law and trade secret law can be used to govern such licenses (UNCTAD, 2011). This Patent Law sets out that licensing agreement shall not contain any provisions that can harm national interest or contain restriction which impedes the ability of Indonesian people to transfer, control, and develop technology (Article 78). If there is license that is contrary to that article, the ministry has right to reject the registration of such license. However, it is hard to see the implementation of this article, as no licensing agreement has been registered by the ministry on the ground that this article needs implementing regulation, but such regulation has not been issued. It is clear that this regulation on license is designed in such a way to promote innovation and technology transfer without restriction as to whether this license agreement is between Indonesian people or entities and foreign entities or foreigners.

Under the TRIPs Agreement, the prohibition of licenses is allowed "to prevent the abuse of IPRs by rights holders or the resort to practices which unreasonably restrain trade or adversely affect the international transfer of technology" (Article 8 (2)). Then, Article 40 provides example of activity that may be deemed as an abuse of IP rights, which is anti-competitive behavior. However, this license rule does not use anti-competitive behavior as the basis to reject license agreement. Conversely, the basis of rejection is whether it can harm national interest or contain restriction which impedes the ability of Indonesian people to transfer, control, and develop technology.

Furthermore, despite the availability of compulsory license provisions that are stipulated under Patent Law, in practice, such a license has not been implemented in Indonesia. Antons argued that some compulsory license provisions were not attractive to local applicants (Antons, 2002). For instance, under the Indonesian Patent Law, a compulsory license can be cancelled if the grounds for its grant no longer exist, without considering the interests of the licensee who may have made substantial investments to implement the license. It means that

Indonesian government fails to use the TRIPs Agreement to protect the interest of local licensees.

Besides license, disclosure requirement is also one of the most important elements to ensure whether patent law is able to promote or impede innovations. It is important for patent applicants to disclose their invention to public so others can learn from it to create a new invention (UNCTAD-ICTSD, 2005). In theoretical realm, fully disclosing invention to public is part of social contract and the essence of granting an exclusive right to patent holder. However, in practice, patent applicants rarely fully disclose their invention in order to protect their economic interest if they fail to get patent. This disclosure requirement is regulated under Article 25. In theoretical realm, fully disclosing invention to public is part of social contract and the essence of granting an exclusive right to patent holder. In addition, under the TRIPs Agreement, member countries can "require the applicant to indicate the best mode for carrying out the invention" as provided under Article 29.1.

The best mode approach is crucial to support competitive condition for creating new inventions and technological development and promoting technology transfer. If the number of foreign patent applications is higher than that of national patent applications, it is important for Indonesia to not only require full disclosure, but also to require to indicate the best mode for carrying out the invention in order to give opportunity for national researchers and inventors to learn information contained in the patent application. If applicants fail to disclose sufficiently and to indicate the best mode, the patent will be rejected.

Moreover, similar with other patent laws, Indonesian Patent Law, Article 19 (3) also provides exception for research and education, provided that it does not harm "normal interest of patent holder" and "not for commercial purpose". This exception is necessary for promoting innovations and technology transfer. Theoretically, by providing such exception, Indonesian researchers have opportunity to carry out scientific research. However, broader research and exceptions of education are permitted by the TRIPs Agreement, so that it will give opportunity for Indonesian researchers to use patented products or processes proposed by foreigners and make some advancements to adjust with local needs. Through this process, technology transfer occurred.

In addition, to support technology transfer and investment and provide work place, Indonesian Patent Law also clearly regulates that patent holders shall make the products and processes in Indonesia. Based on the above analyses, it can be said that Indonesia Patent Law is not comprehensively designed to promote innovations and technology transfer. This law does not fully use flexibility provided by the TRIPs Agreement to enhance technological

capacity. However, patent law alone would not be adequate to deal with both problem of technology transfer and lack of national innovation capacities.

4.2 Indonesian Policies and Regulation on Technology Transfer; A Challenge

The problems concerning technology transfer policy in Indonesia cannot be separated from the problem with overall national technology policy. Until 2002, there was no single law and regulation in the field of science and technology that could be used as a foundation for the development of technology transfer in Indonesia although the first national patent law has been introduced since 1989. In the absence of any laws and regulations on transfer of technology during that time, Indonesia took a liberal approach to transfer of technology in the meaning that it was essentially unregulated.

It was then suggested that government intervention to regulate technology transfer agreement was needed because local corporations had a lack of bargaining power and a lack of commercial experience in their negotiation with foreign firms as technology suppliers. The government intervention policy might help to avoid any unfair restrictions and conditions in such agreements (Wie, 2001). However, there was no indication that the government would change its liberal approach to technology transfer because: firstly, the restrictive conditions might slow down the inflows of foreign direct investment (FDI) and the accompanying important technology imports, which were currently needed to revitalize the Indonesian economy, and secondly, in general, the government officials did not have the necessary business experience and knowledge on industrial technologies (Wie, 1998).

Indonesia also had no specific instruments to monitor, filter, and control foreign technology imports (Wie, 2001). Consequently, accurate information regarding the amount of technology that inflows into Indonesia, including the fees and royalties paid for the use of patented foreign technologies, was not available (Wie, 2001). Similarly, there was also no available data on the number of technology licensing agreements signed by Indonesian corporations with their foreign licensors. Although the Indonesia Investment Coordinating Board (*BKPM- Badan Koordinasi Penanaman Modal)* has the authority to asses any aspects of investment proposals, including technology transfer agreement and its components, but in practice, it has rarely happened, probably due to the lack of technical expertise of BKPM officials.

Inevitably, the policies and principles of regulation of technology were mostly presented in the 'official speech' of executives (*pidato pejabat*), which is non-binding and therefore, difficult to implement (Tampubolon, 2005). One of the most fundamental problems

of scientific and technological development has been the Indonesian Government's commitment. This was indicated by the limited budget for development of science and technology (Tampubolon, 2005). In 2016, for example, R & D expenditure (per capita) was only 0.2 percent of Gross Domestic Product (GDP), the lowest compared to Singapore, Malaysia, and Thailand (LIPI, 2016). In 2017, it was 0.21 percent of GDP (Pramitasari, 2017) and in 2018, it was increased slightly. It was well behind ASEAN neighboring countries like Thailand and Malaysia and less than India, China, and Pakistan. Ministry of Science and Technology acknowledged that the R&D expenditure was far from enough, but the government was still unable to provide a bigger funding (Antara, 2019; LIPI, 2017, 2016).

Two decades ago, it had been claimed that Indonesia's current scientific capabilities were extremely low and the private sector has also had difficulties attracting domestic R&D capital partly due to Indonesia's lack of proficiency compared with world standards (Butt, 2002). This condition has changed, scientific capability in Indonesia is relatively proficient. However, this potential is meaningless without consistency in policy and adequate research infrastructure and facilities to support the work of researchers and scientists in Indonesia. This may also be due to an inability to establish linkages between government-sponsored research and private industry. Government funding dominated most R&D in Indonesia and involvement of private sector was limited. As an example, in 2019, 90% of research funds were provided by the government, while only 10% was supported by the private sector (Ulya, 2019). The situation was unlike in other countries, such as Japan, Korea, Singapore and India, in which private sector involvement in R&D was higher than public sector.

Then, in 2015, the Government Regulation on Transfer of Technology was introduced for the first time in Indonesia. As stipulated under Article 1, the regulation defines that technology transfer is not limited to national technologies, but also foreign technologies, although no further provision regulates foreign technology transfer. This regulation focuses on several important aspects: university's obligation to carry out technology transfer, the ownership of IPR resulted from public research institutions, and the use of income derived from local technology transfer. However, the regulation neither affects nor facilitates transfer of foreign technology as it does not touch business entities or FDI.

The most important provision of the Regulation specifies that both local and national governments are the owners of publicly funded IP rights (Article 5), while researchers and inventors will receive recognition and reward (*imbalan*) for their works (Article 7). This suggests that the relationship between public researchers and government is like the relationship between employer and employee under Indonesian Patent Law. This provision

may be intended to ensure that the benefits of publicly funded research are available to all, but such an approach provides little motivation in encouraging research and innovation because researcher has no right to determine and manage the use of IPR and other R&D results (Article 8).

With this scenario, the researcher will only carry out research and the result will be submitted to the government that will secure and protect it through IPR (Article 11). This means that the most responsible body for the application of IPR is the higher education and R&D institution in which the researcher is employed because the management of IPR and result of R&D are mandated to universities and R&D institutions (Article 10). Accordingly, it is an obligation of those institutions to establish work units that are responsible for technology transfer management to implement that provision (Article 16). Nevertheless, if R&D activities are partly funded by other parties, the IPR resulting from those activities can be owned collectively by both the government and the party involved (Article 5).

This regulation provides that technology transfer can be done commercially or non-commercially (Article 14). The purpose of non-commercial technology transfer is to encourage mastery of science and technology, creation of scientific and technological findings, and development of small and medium enterprises needed by community. Terms and conditions of technology transfer are that preferred recipient residing in Indonesia, having capacity to use and master science and technology for public benefit, IPR and result of R&D activities that are technologically transferred are not confidential under the law, and no conflicting with public order and statutory provisions (Article 13). This regulation also obligates higher education and R&D Agencies to establish special unit that is responsible for management of technology transfer and result of R&D (Article 16), which can be conducted through license, cooperation, science and technology services, and publication.

The existence of this regulation may not help Indonesia to gain access to technologies that are required for its development. This is because the regulation does not focus on the importance of foreign technology licenses to national corporations and other national institutions. It does provide opportunity for foreign corporations to manufacture locally to provide employment for local workforce, but does not address real technology transfer issues. In addition, this regulation needs to be revised to adjust with the new Act on National System of Research, Development and Application of Science and Technology of 2019, so that all legislations and regulations related to technology transfer are supportive and consistent with each other.

4.3 Indonesian Legislation and Policies on National System on R&D and Application of Technology

In 2002, Indonesia issued the Law on National System of Research, Development and Application of Science and Technology known as SINAS IPTEK. This law provided promising legal basis for development of science and technology and a foundation for technological policy in Indonesia. It shifted technological policy that stipulated the importance of 'strengthening the capacity to audit technology imports' in line with a national standardization policy (Article 19 (c)). The audit aimed to prevent the national market from being flooded by poor-quality cheap foreign products and processes. However, this law had a number of weaknesses. Several provisions were lack of consistence with other prevailing legislation and needed implementing regulations and thus, lack of effectiveness. However, in 2019, this law was regarded as less up-to-date with the current development and accordingly, replaced by the Law Number 11 of 2019 with the same title as its predecessor, SINAS IPTEK.

The new law regulates R&D and application of technology in comprehensive way and sets out master plan for the advancement of science and technology (Article 8) that is in line with national development plan. Under the law, the government assesses the level of technological readiness (Article 26) and establishes mechanism for coordination between institutions and sectors for policy formulation, budget planning, and its implementation. Article 22 provides management of IPR from R&D result, but no new IPR policy. In principle, this law regulates that ownership and royalty of IPR derived from public funding belong to national or local governments or R&D agencies as regulated by Patent Law and other IPR laws. Furthermore, the result of national innovations and inventions shall be facilitated by national government to obtain protection of IPR and its utilization (Article 35). However, Article 21 has a potential to inhibit application of IPR protection as it obligates publication and dissemination of R&D result.

Surprisingly, this new law also regulates technology transfer (Article 28), which can be done commercially or non-commercially, while the terms and conditions of carry out such transfer as stipulated under Article 29 are similar to the Government Regulation on Technology Transfer of 2005. The Article 29 also provides various schemes for technology transfer implementation, that are though license, cooperation, science, and technology services, and it shall be carried out in a manner not contrary to public order and statutory provisions. Furthermore, procurement of technology transfer result shall be carried out through technology clearing and technology audit. Both of them shall be carried out by national government on publicly funded strategic technology (Article 25). This law also recognizes technology

intermediate to bridge innovation and invention processes and to bridge producers and users of technology (Article 30).

Furthermore, this law specifically regulates invention and innovation (Article 34). It obligates both national and local governments to develop invention and innovation with the purpose to solve national problem and to add more value to products for public welfare. Such invention and innovation are derived from various activities, such as basic and applied research, technology transfer, reverse engineering, intermediate technology, diffusion of science and technology, and commercialization of technology (Article 34).

Similar to previous law, this new SINAS IPTEK focuses on how to increase national R&D, innovations and inventions, and its utilization for national development, but it pays less attention to facilitate international technology transfer. Both national and local governments shall use national innovations and inventions (Article 36). Similarly, the national government shall also ensure to use R&D result in the form of inventions and innovations for national development (Article 37). Those articles show that international transfer technology is not the main priority for Indonesia, although the law mentions that R&D and its application can be carried out by foreign institutions and foreigners under Article 75 (1) with permission from national government.

Interestingly, this law strictly regulates the use of overseas funding by foreign institutions, foreigners, and Indonesians in R&D and its application in Indonesia as required by Article 76. Those foreign institutions or foreigners are required to comply with statutory provisions, produce outputs that benefit the Indonesian, have Indonesians work partner and use national technology, mention the name of institutions and persons in each output produced in joint activities, conduct technology transfer, submit primary data of R&D, provide proportional profit sharing in accordance with the agreement of the parties concerned, and make a written agreement on transfer of material in both physical and digital form. Such obligations seem fair and reasonable on the basis to prevent misappropriation of R&D result by foreign entities and individuals that may harm Indonesia and national researchers. In the last few years, such misappropriations have been happening, in which one of the foreign institution partners published research result in international scientific journal without adding the name of Indonesian partners and national researchers as co-authors (LIPI, 2012). This Article 76 is intended to promote technology transfer and access to technological innovation. The problem is on how to ensure that such obligations will be implemented well by foreign research partners without well-developed monitoring scheme.

The law also shows strong commitment of the government to enhance R&D and supports innovations and inventions. These commitments are manifested not only the in the form of incentive for universities that produce a lot of inventions and innovations, but also establishment of endowment fund for R&D. Business entities will also receive tax reduction as an incentive to produce inventions, innovations, mastery of new technology, and technology transfer for industrial development to increase industrial competitiveness. This tax reduction is part of strong government commitment.

Before the existence of this law, the institutional structure of science and technology agencies and its organ are quite well administered, but there are still areas of overlap between one R&D agency and another (Tampubolon, 2005). This law tries to integrate all potential research institutions, such as universities, business entities, and sectoral research agencies, with national research agencies to develop networks, carry on partnership programs for mutual cooperation to strengthen their relationship, and to avoid overlapping programs. This is because each department would tend to conduct its own research. The budget distribution to each department, according to the State Financial Law Number 17 of 2003, has a potential to contribute to repetition and duplication of research activities among the departments. Therefore, the State Financial Law does not enhance the spirit envisaged under SINAS IPTEK Law and instead weakens the coordination of science and technology which the program hopes to strengthen. Furthermore, it complicates the effective use and control of R&D funds, which are already regarded as small.

5.0 CONCLUSION

It is not easy to see that the implementation of international patent law promotes innovation and technology transfer in Indonesia due to several reasons: Firstly, Indonesia Patent Law is not comprehensively designed to promote innovations and technology transfer. It does not fully use flexibility provided by the TRIPs Agreement to enhance technological capacity particularly in the areas that have a crucial impact on innovation and technology transfer, which are license including compulsory license, full disclosure requirement, and broad research and education exceptions. Therefore, it is not easy for national researchers to imitate accurately the patented technological inventions filled by foreigners and foreigner entities in Indonesia and to master new science and technology for national development. Thus, the amendment of Patent Law is required.

Secondly, if the patent law has been already drafted in such a way to support technology transfer, it would not be adequate to deal with both problems of technology transfer and lack

of national innovation capacities, unless there is sufficient and consistent policies and regulation on technology transfer and strong commitment to build and improve national innovation competency. The Government Regulation on Technology Transfer may not help Indonesia to gain access to technologies that are needed for the development of the country because this regulation does not focus on the importance of foreign technology licenses to national corporations and other national institutions. It does provide opportunity for foreign corporations to manufacture locally to provide employment for local workforce, but does not address real technology transfer issues. This regulation needs to be revised to adjust with the new Law on National System of Research, Development and Application of Science and Technology, so that all legislations and regulations related to technology transfer are supportive and consistent with each other.

Lastly, the policy on national system on R&D has significant influence to promote and impede innovation and technology transfer. Indonesian Government has issued new law in this context and this law shows a strong commitment of the government to enhance R&D and support innovations and inventions. These commitments are manifested in the form of incentive for universities that produce a lot of inventions and innovations, establishment of endowment fund for R&D, and tax reduction for business entities as an incentive to produce inventions, innovations, mastery of new technology, and technology transfer to increase industrial competitiveness. However, this new law focuses on how to increase national R&D, innovations, and inventions, but pays less attention to facilitate international technology transfer. It seems that international transfer technology has not been the main priority for Indonesia. Without comprehensiveness and consistency of all prevailing laws and regulations related to technology transfer, such transfer will not automatically occur.

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