APPLICATION OF GREEN INTELLECTUAL PROPERTY ON GREEN TECHNOLOGY IN MALAYSIA AND ITS BENEFIT: A REVIEW OF THE LITERATURE

M.N. Ridzuan and B.C. Chew

Faculty of Technology Management and Technopreneurship,
Universiti Teknikal Malaysia Melaka, Hang Tuah Jaya,
76100 Durian Tunggal, Melaka, Malaysia.

Corresponding Author's Email:nazmi41191@gmail.com

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ABSTRACT: Intellectual property (IP) is commonly associated with a protection of an invention. Green IP exists not only due to the changing climate but also due to the sustenance of the global eco system. Developed countries such as Japan, United States, German and France have used the green intellectual property for their green technology protection. Hence, the Malaysian government should use this system as well. The objective of this paper is to analyse the implementation of Green IP in terms of social, economic and environmental aspects. The literature review consists of journals published within the year 2007 to 2017 to determine the meaning of Green IP and how it benefits Malaysia in terms of the social, economy and environmental aspects throughout the literature review. This study will enhance the development of Malaysia's standard in green technology and the development of nation growth.

KEYWORDS: *Green Technology; Green Intellectual Property; Social Aspect; Economy Aspect; Environmental Aspect*

1.0 INTRODUCTION

Environmentally or green themed businesses, products and technology are coming from all angles. "Green" has become an important element used to tackle environmental issues and promote sustainable development that can derive the economic growth especially in the phase of economic downturn [1]. For the same

reason, the green technology is created to provide opportunities and potential such as cost-saving, economic creation and innovation for the benefit of humankind and environment [2]. The IP protection is needed for every invention especially green technology. This is because, rather than just promoting the technology, IP facilitates the progress and well-being of humanity, encourages innovation and increases the quality of life [2-3]. Other than that, with IP the owner can gain exclusive rights over the technology such as making, use, selling and importing it legally [4]. Patents, copyright, trademark and trade secrets are examples of IP rights that can be used to protect a creation [5]. The scarcity of the literature makes it a little difficult to form the best working definition of Green IP. The present study defines Green IP as a sustainable approach in implementing the protection on any green technology that exists in a product or service that has been created. The idea is that the Green IP is encompassing trademark law concepts and other issues of consumer protection, green branding and green marketing [6]. The objective of this paper is to analyse the implementation of Green IP in terms of the social, economic and environmental aspects.

2.0 GREEN TECHNOLOGY

Green Technology is the development and application of products, equipment and systems used to conserve the natural environment and resources, which minimize and reduce the negative impact of human activities [7]. The opportunity to fill the green market and the demands that increase year by year have made many companies use green as the added value and business strategy. Green technology also refers to any products, equipment or system that have these four criteria which are minimizes the degradation of the environment, has a zero or low greenhouse gas (GHG) emission that safe to be use for health and environment, conserves the use of energy and natural resources, and lastly promotes the use of renewable resources [7].

In another perspective, consumer is one of the important elements in implementing green technology because any green technology would ultimately need support from the actual user [8]. There are ten technical characteristics for a consumer to identify a green product. The products may be made from natural and/or renewable resources;

bio-degradable; locally obtained; easily reused; no Chlorofluorocarbons (CFCs), hydro chlorofluorocarbons (HCFCs) or other ozone depleting substances; readily recycled; no environment degrading toxic chemicals or by-products in its life cycle; incorporates recycled content; promotes good indoor air quality; durable, low maintenance [9]. If one of these characteristics exists, the product is better than the traditional product that may harm the environment.

The use of green technologies can be a way to solve the climate change problem by offering consumers to lead a healthier lifestyle such as alternative energy resources, energy stores, management technologies, recycling and waste technologies and the disposal of greenhouse gases [10].

On the contrary, there are three main challenges of green technology that enable it to be of use in reducing or avoiding the problem of climate change. At the first stage, they need to encourage the major economic players to support "green" innovation, promote the distribution of "green" technologies across all products and services and allow developing countries to access these technologies for the benefit of social, economy and environmental sustainability [11]. The three challenges are important to encourage the diffusion of green technology in the market. The use of IP can be a good opportunity for technology transfer and diffusion but it can also be a possible barrier for the diffusion of green technology [12].

Table 1 shows top 6 green companies in the world in 2016 [13]. Table 1 shows a list of developed countries such as Ireland, the United Kingdom, Switzerland, United States of America and France. The ranking is based on companies' performance that measures eight indicators. They are energy productivity, greenhouse gas (GHG) productivity, water productivity, waste productivity, green revenue score, sustainability pay link, sustainability board committee and audited environmental metrics.

Table 1: Top 6 Green Company in the World 2016

Rank	Company	Country	Global Industry Classification Standard (GICS) Sector
1	Shire PLC	Ireland	Health Care
2	Reckitt Benckiser Group PLC	United Kingdom	Consumer Staples
3	BT Group PLC	United Kingdom	Telecommunication Services
4	Swisscom AG	Switzerland	Telecommunication Services
5	Essilor International SA	France	Health Care
6	Nike Inc.	United States of America	Consumer Discretionary

Each of the companies has been categorized based on the global industry classification standard (GICS). Each company uses IP to run their businesses. It may come in terms of their trademark that gives information on the benefit of their product to the environment or patenting product, service, or process that provides environmental benefit. Referring to table 1, instead of renewable energy such as solar, wind, and biofuel, any technology that can improve and reduce the impact toward environment is classified as green technology. Creative implementation of IP in business may give a big impact toward the social aspect, as well as the economy and the environment.

3.0 GREEN IP RIGHTS AND ITS RELEVANCE TO GREEN TECHNOLOGY

IP is considered as a business asset other than just excluding the competitor and having exclusive right of a market by avoiding others from copying or stealing its products or services without the permission of the right owner [14]. The existence of IP rights allows the creators or owners of patent, trademarks or copyrighted works to benefit from their own work or investment in a creation [3]. Moreover, the use of IP is recognized in shaping the development and diffusion of green technology where the approach works by encouraging more environmental friendly creation to be created to prevent the development of environmentally unfriendly technology [15]. Even though every IP right requires a fee, it also offers a future investment. That said, IP rights provide the incentives to invest in research and development and operate as the modalities for recouping those investments and turning a profit, despite the

essentially non-rivalled character of intellectual creations in the raw state of affairs [16]. The definition of "green" is universal and it is given a lot of definitions by scholars. Green can be defined as any activities that sustain the environment [17]. On the other hand, 'green' is also used to imply that a service, product or technology is environmentally friendly [18]. However, "green" is mostly defined as something that can reduce or minimize the negative impacts on the environmental-related human activities [19-20]. In any case, green IP is defined as a sustainable approach in implementing the protection on any environmental friendly element that exists in a product or service that has been created. Besides protecting the invention of the green technology, the welfare of the consumer can be protected by the green IP as well [6].

The application of green IP is to control the diffusion of technology for the sake of sustainability and not merely for the protection of the creation [5-6]. Protecting green technology using Green IP is one of the initiatives that can be used to generate the wealth creation of commercialization and to be responsible for the humankind and environment. That being said, invention can be excluded from patentability if the invention could endanger public order or morality such as the protection of human, animal or plant life or health [21].

Table 2: Technological IP and Non-technological IP

Technological IP	Non-technological IP
Patents, integrated circuit designs, copyright in relation to computer programs, protection against unfair competition (including trade secrets and confidential information)	Copyright, trademarks, industrial designs, geographical indications, protection against unfair competition (including trade secrets and confidential information)

Each of the IP rights has a different relationship from the technology and has various effects depending on the type of IP. Table 2 shows two types of IP two categories which are technological IP and non-technological IP [15]. Most of the technologies and invention are protected under the technological IP. In any case, non-technological IP is not a direct solution to achieve sustainability, but it encourages sustainability by promoting green technology to the consumers [15]. Our country Malaysia is still far behind when it comes to the Green IP system where we still use traditional IP and the adoption of green technology is still at its infancy.

Nevertheless, several national IP offices have started implementing green IP such as green patent application where the subject matter eligibility defines the categories of green technology that qualify for an accelerated examination [1]. Malaysia should follow IP offices from Brazil, Korea, Australia, United Kingdom and Japan that have all set up fast-track schemes to accelerate the processing of the green patent application [22]. Currently, a pilot program that involves the collaboration between Intellectual Property Corporation of Malaysia (MyIPO), Japan Patent Office (JPO) and European Patent Office is carried out for a period of 3 years [23-24]. The pilot program of the fast-track schemes of green patent is known as the Patent Prosecution Highway (PPH) in Malaysia. On the contrary, the establishment of SIRIM ecolabel and MyHIJAU mark are both good examples of Malaysia's efforts in implementing Green IP in the trademark perspective. The existence of these ecolabels will be able to put added values on any green product or service generated by ensuring that the trademarks are able to provide enough information. This is because an ecolabel can provide consumers with the information about the environmental quality of individual products at the point of purchase that can make consumers choose products that are acceptable from an environmental point of view [25].

Although this is such a small contribution, Malaysia will move towards sustainability in the Green IP system establishment and shift to other forms of IPs such as copyrights and trade secret.

4.0 BENEFIT OF GREEN IP ON SOCIAL, ECONOMIC AND ENVIRONMENTAL SUSTAINABILITY

4.1 Social Sustainability through Green IP

The worldwide challenge of climate change mitigation has caused the social welfare cost to be greater because social welfare is strengthened by the diffusion of green technology [10]. While [15] said that the diffusion of green technology through Green IP can be potentially encouraged since IP rights are central to the technology namely as transferrable, licensable and protectable in the form of infringement. Fundamentally, Green IP has a strict rule towards sustainability. For example, it trains people to be more disciplined and have more sense

of good judgments when choosing any green product. There are six key factors that help green consumers in selecting and purchasing a more ethical technology product and increasing their awareness towards green products; the consumer's green value is strong, the consumer has purchase experience, the consumer has plenty of time for research and decision-making, consumer has good knowledge of the relevant environmental issues, green products are reasonably available and the consumers can afford, and are prepared for the financial costs [26].

The Green IP knowledge will be able to educate people on how to acquire reliable green technologies that have been recognized by the authorities, inspire the potentially commercialized idea of green technology of product invention and creation, as well as new job creation and future opportunities [27]. The access of green technology and new knowledge will improve the quality of life with positive, healthy and safe environment for everybody. People will be able to use expensive technology and healthcare such as vaccines, water purification and electrical appliance. Therefore, the social reputation can be increased and social innovation can be encouraged [28].

4.2 Economic Sustainability through Green IP

IP does not only contribute in protecting the technology or creation from being used by competitors but it also has other responsibilities. Green IP might be used to generate the revenue through licensing or selling green technology products, attracting investors and encouraging competing businesses to develop their own technologies rather than copy each other [14]. Alternatively, Green IP helps providing an access of the technology for others. Green IP will allow more people to use green technology when more companies can adopt the green technology and use them to create new products or services which in turn, will increase their income. Stronger IP rights will increase the technology transfer and improve the export performance of recipient firms which will lead to other benefits such as capital, labour or some combination thereof [6,30]. Hence, this scenario will boost the production and utilization of green technology-based products which will enhance the confidence of the private sector in the green technology development. The private sector is a key player in both development and transfer of technologies which

gives a great impact towards the country's economy because they are more proactive than the public sector in R&D [5].

Moreover, green washing problem could be overcome using Green IP. Green washing is instances of false or misleading claims of environmental benefits associated with purportedly green products, services or practices which appear to be on the rise, a disturbing trend considering the importance of green consumers in using and implementing clean technologies [30]. The confusion of product advertisement can affect consumers' decision in buying green products. Even though the technology claims it is "green" in the production but it may give bad effect to the environment. The green market should be protected and guided by Green IP to guarantee consumer decision. The wide application of Green IP in product and service will make people easily aware on the availability and the benefit of reliable green technology. Most economists have recognized that IP has positive effect on innovation [11]. More green inventions will be created and they will be able to be sold into the market to fulfil customers' demands while conserving the environment.

4.3 Environment Sustainability through Green IP

Malaysia has expressed their two principal outcomes in the Eleventh Malaysian Plan to reduce GHGs emission intensity of GDP by up to 40% compared to 2005 levels by the year 2020, and to conserve at least 17% of terrestrial and inland water areas, as well as 10% of coastal and marine areas. Both principles are the expected outcomes from the transformative green growth executed from 2006 to 2020. In general, Green IP will strengthen the effort and hope for Malaysia to gain the Malaysia's strategic thrust to pursue green growth for sustainability and resilience where the growth that is efficient in its use of natural resources, clean in that it minimizes pollution and environmental impacts, and resilient in that it accounts for natural hazards and the role of environmental management and natural capital in preventing physical disasters [27].

Environmental sustainability depends on three factors which are climate change (magnitude and frequency of shocks), system vulnerability (extent of impact damage) and lastly system resilience (ability to recover from impacts) [31]. From the environmental concern

and sustainability perspective, a lot of companies have changed their business model to avoid or reduce the impact towards the environment. For example, SC Johnson's Greenlist™ products are not only meet the legal and regulatory requirements for the product category, but the Greenlist cue also signifies that the product has a low impact on the environment and human health [31].

SIRIM ecolabel and MyHIJAU mark label or known as ecolabel in IP are examples of IP that can move to green IP. The ecolabel concept suggests that the environmental sustainability through substituting purchases can lead to more sustainable consumption [32]. Green IP gives the opportunity to ensure the reliability of a green creation while protecting the consumer rights and environment. As we move into an age where there is a greater awareness of the need for sustainable and environmentally-friendly practices, there is now an intensifying debate regarding the role that IP rights should play in mitigating climate change [15]. This commitment is to ensure that the environment is always being protected and conserved for the present and future generations while pursuing development.

5.0 CONCLUSION

In conclusion, this paper explores into the benefit of Green IP on social, economic and environmental areas that may be possible to be implemented in Malaysia. Beyond climate change, green technology has been an important tool to achieve sustainability using Green IP. Despite that, Green IP can lead to competitive advantage, protection for green technology, being environmentally friendly and the assurance that the consumer welfare is managed properly. Invention successfulness can only be determined by doing research that has been funded and all inventions should go through experimentation phase to test their reliability. The reliability of a green creation must be equipped with better rules and regulations to determine the sustainability of the creation. The Malaysian government must implement this initiative as it has been applied by several developed countries such as the United States of America, the United Kingdom, German and France. It is not to imitate them; instead it is a commitment to lead Malaysia to be a successful nation. The development of green technology in Malaysia through Green IP will

make the level of Malaysia's standard higher and competitive with other developed countries. Since Green IP is still new in Malaysia, the researchers suggest that more research is done on the enhancement and protection of green technology in Malaysia using Green IP. The research can be in the trademark, copyright, patent or even trade secret. The researchers hope that Green IP can be implemented in Malaysia as it can maximize its potential to be an advanced nation especially in green technology and pursue the development and growth of the nation.

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