

Critical Analyses on the Role of Intellectual Property in Promoting Sustainable Development

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Abstract

It is widely held that development Intellectual property rights (IPR) are fundamental for the protection of invention, creativity, and learning, even though, the practical application of IPR within the sustainable development context is complicated and demanding. The aim of sustainable development is the fostering of a nation's economic growth while safeguarding the natural environment and guaranteeing social justice. The practical application of IPR can impede the accomplishment of these aims. This paper will consider the obstacles inherent in applying IPR to the sustainable development context. This article will emphasize the substantial role that safeguarding intellectual property rights can play in progressing social, technological, economic and cultural growth. This paper aims to provide a concise overview of intellectual property in the context of sustainability. This paper explores the dynamic convergence of intellectual property (IP) and sustainable development, as well as the present challenges encountered. Given the broad range of sustainable development, which encompasses economic, social, and environmental issues. The issues of sustainable development and intellectual property rights, despite the progress that has been made, the improvement of public comprehension and knowledge of IPR, the consolidation of implementation mechanisms, and the enhancement of the efficiency of IP legislation and regulations. In addition, it is imperative to strike a balance between the protection of intellectual property and the improvement of the accessibility of essential products and services, particularly those related to environmental sustainability and intellectual property rights.

Keywords: Intellectual property rights; Innovation; Environment; Sustainability.

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دراسة نقدية لدور حقوق الملكية الفكرية في تعزيز التنمية المستدامة

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ملخص البحث:

من الملاحظ وعلى نطاق واسع أن تطوّر قوانين و حقوق الملكية الفكرية تشكّل ركيزة أساسية لحماية الابتكارات والإبداع والتعلم، على الرغم من أن التطبيق العملي لحقوق الملكية الفكرية في سياق التنمية المستدامة يعتبر معقداً ومتطلباً مستمرا. حيث أن الهدف من التنمية المستدامة في نطاق حقوق الملكية الفكرية هو تعزيز النمو الاقتصادي للدول مع توفير الحماية البيئية للطبيعة وضمان العدالة الاجتماعية، إلا أن التطبيق العملي لحقوق الملكية الفكرية ربما يشكل عائقا لتحقيق هذه الأهداف والتمثلة في العدالة الاجتماعية وتعزيز النمو الاقتصادي الشامل. تناقش هذه الدراسة الدور الجوهري لحقوق الملكية الفكرية في سياق التنمية المستدامة وما الذي يمكن أن تؤديه حماية حقوق الملكية في إحراز التقدم والنمو الاجتماعي، التكنولوجي، الاقتصادي والثقافي. تهدف هذه الدراسة إلى تسليط الضوء على الاطار القانوني العام عن حقوق الملكية الفكرية ودوره في تعزيز التنمية المستدامة ولتحقيق هذا الهدف تبنى البحث منهج التحليل والنقد والذي من خلاله يتم مناقشة التقارب الديناميكي بين حقوق الملكية الفكرية والتنمية المستدامة بالإضافة إلى التحديات الحالية التي تواجهها والتي تشمل القضايا الاقتصادية والاجتماعية والبيئية. ناقشت الدراسة عددا من التوصيات تتبلور حول حقوق الملكية الفكرية والتنمية المستدامة وتشتمل هذه القضايا على تعزيز كفاءة تشريعات حقوق الملكية الفكرية واللوائح، وتوحيد آليات التنفيذ، وتحسين الادراك الوطني والمعرفة العامة بحقوق الملكية الفكرية وتحقيق الأهداف والاستراتيجيات الوطنية للتنمية المستدامة.

الكلمات المفتاحية: حقوق الملكية الفكرية؛ الابتكار؛ البيئة؛ التنمية المستدامة.

1. Introduction

Since ancient Greek thinkers acknowledged the connection between property and inequality, the topic has remained politically and philosophically significant. The issue of equitable division of property and its link with freedom, equivalence, and individual and societal contentment remain key questions. Intellectual Property Rights (IPRs) indirectly affect numerous aspects of life. Its function has expanded in recent years as a result of technological development and its connections with various legal and international treaties (Balaban, 2018: 55).¹ Sustainable development is an area where the impacts of IPRs are felt. International legislators have been discussing sustainable development for years and its fundamental aim is to meet our social, environmental, and economic requirements, creating wealth for current and future generations.

While Intellectual property (IP) has a solid place in sustainability, there is scope for its association with, and effect on, environmental, social and economic factors to be additionally developed. For instance, upward of six of the United Nation's Sustainable Development Goals, (specifically, eradicating hunger, access to fresh water and public health, availability of reasonably priced energy, development of industry, infrastructure and innovation, expansion of urban and community sustainability and the development of responsible economic consumption and production) clearly overlay current descriptions of sustainability and will entail the implementation of an array of new technology (Stivers, 1976: 56).² It is therefore vital that in order for the UN's goals to be achieved, technology targeted at sustainability and ecological factors (which may also be known as 'green' technology) should be a development priority. IP, regardless of whether it refers to the area of patents, copyright, trademarks, designs or another 'adjacent' right, is a key player in the exploitation and safeguarding of relevant technology. Considering that IP is essentially a marketable commodity, it could potentially create revenue to expand the innovation and development of technologies necessary to achieve sustainable goals. IP rights grant exclusive rights regarding particular information, processes, products, and services, which lacking an incentive, may be economically unviable. Yet IP concerns remain, limiting or creating barriers to the development of Environmental, Social and Corporate (ESG) goals. These goals are investigated later in the study. Essentially, the function of IP within sustainability varies between patents, copyrights, corporate secrets, company trademarks, and design rights, and these are illustrated below (Henry and Stiglitz, 2010: 239).³

1 Balaban, G.N.B. (2018). *Topologies of Global Governance in Geneva: Fragmentation of the Intellectual Property Regime*. Binghamton University State University of New York, Ph.D. diss.

2 Stivers, R. (1976). *The Sustainable Society: Ethics and Economic Growth*. Westminster Press.

3 Henry, C. and Stiglitz, J. (2010). "Intellectual Property: Dissemination of Innovation and Sustainable Development." *Global Policy*, 1(3).

1.1. Aims and Objectives of this Paper

This research aims to address significant issues concerning the relationship between intellectual property rights and sustainable development. It also aims to examine the relationship between intellectual property rights and other significant areas of sustainable development law. Furthermore, it examines the pertinent international legal frameworks and their implications for the development of legal systems in developing nations. The primary additional objectives of this research are outlined as follows:

1. To examine the relationship and effects of intellectual property rights systems on sustainability and the equitable distribution of benefits arising from their utilisation.
2. To analyse the impact of the international legal framework for the promotion of intellectual property rights on legal regimes in developing countries.
3. To analyse pertinent legislation in developing nations.
4. To identify potential solutions for these issues and outline the path forward for each at both national and international levels.

Research has explored the influence of intellectual property rights on innovation, however, there is a scarcity of studies assessing their impact on the attainment of sustainable development goals across diverse international contexts. The relationship between patents and copyrights and environmental objectives is both complex and multifaceted, particularly in the context of developing countries.

1.2. Structure of this paper:

- A general overview of sustainability and intellectual property (IP), and the impact of IP on sustainability
- A short history of intellectual property
- Intellectual property rights
- The role of intellectual property in sustainability, covering patents; trade secrets, its ethical considerations and how to balance them with innovation, trademarks and copyrights
- The concept of sustainability towards intellectual property rights.
- The International Centre for Trade and Sustainable Development (ICTSD) and its role in extending the discourse of intellectual property and the sustainable development globally.
- The intersection of IPR and sustainability
- How intellectual property rights can support sustainable development
- Conclusion
- Recommendations.

2.0. Sustainability and IP

The modern concept of sustainable development (SD) is often ascribed to the Brundtland report (1987) which was presented to the UN but was considered a somewhat weak idea. It was defined as

development that meets the needs of the present without compromising the ability of future generations to meet their own needs.⁴

Recommendations were made that this definition should be redefined to,

...development that meets the needs of the present while safeguarding Earth's life-support system, on which the welfare of current and future generations depends.

Hence, sustainability can be said to denote all policies and progress. This is evident from the stated UN worldwide goals for sustainable development (SDGs), the '2030 Agenda'.⁵ Podder et al. (2020) note that the 17 stated goals incorporate a range of topics such as the eradication of poverty and deprivation and safeguarding of healthy lives (goals 1–3), the safeguarding of fresh water and public health (goal 6), access to reasonably priced and clean power (goal 7), industry, infrastructure, and innovation (goal 9) and environmental action (goal 13), and additionally more wide-ranging goals such as gender equality (goal 5), peace, legal impartiality and strong institutions (goal 16).⁶

2.1. Intellectual Property and its Impact on Sustainability

IP is key in progressing sustainable development goals (SDGs), as IPRs contribute to developing new knowledge and also encourage innovation particularly in new tech, as IP facilitates the pathway from mere invention to impactful solution within a range of industries such as telecommunications, agriculture, transportation, biotechnology and green technologies.

By incentivising innovators and creators to develop solutions that align with the SDGs, intellectual property rights operate as advocates, fostering an atmosphere that encourages

4 United Nations Development Programme, 'The SDGs In Action' United Nations Development Programme, (New York, 2021), < <https://www.undp.org/sustainable-development-goals> >, accessed 26 October 2024. In this article, the United Nations Development Programme described the Sustainable Development Goals as 'a universal call to action to end poverty, protect the planet, and ensure that by 2030 all people enjoy peace and prosperity.'

5 David Griggs et al. (2013). "Sustainable development. Goals for People and Planet.", 495 *Nature*, 306.

6 Podder, S., Burden, A., Singh, S.K. and Maruca, R. (2020). "How Green Is Your Software? Sustainable Business Practices." *Harvard Business Review*. Accessed 11 April 2024: <https://hbr.org/2020/09/how-green-is-your-software>

innovation and sustainable practices. By protecting inventions, patents, utility models, and registered designs help to drive innovation across a wide range of industries linked to the SDGs, including healthcare, renewable energy, and agriculture. Having the sole right to their inventions allows innovators to take chances, spend money on R&D, and contribute significantly to the sustainable growth of the world.

A tangible example of this for instance can be seen in Peru. Peru is a Latin American country which possesses significant biodiversity and a wealth of *traditional knowledge*, particularly regarding medicinal plants and agricultural practices. The country has established innovative legal mechanisms to protect traditional knowledge from biopiracy, including the implementation of a national database for traditional knowledge. The action has implications for multiple Sustainable Development Goals, specifically SDG 2 (Zero Hunger), SDG 3 (Good Health and Well-being), and SDG 15 (Life on Land) (Sell, 2003). This indicates the role of intellectual property rights (IPR) in fostering development within a framework that safeguards traditional knowledge, benefiting both biodiversity and indigenous communities in their own contexts.

Intellectual property facilitates innovation by providing inventors and writers with essential legal protections, enabling them to invest time, economic resources, and mental effort into developing new technologies or solutions. This aspect of IPR is crucial for the development of agriculture, medicine and renewable energy, and therefore inextricably linked to the objectives of various Sustainable Development Goals including SDG 7 (Affordable and Clean Energy), SDG 3 (Good Health and Well-being), and SDG 2 (Zero Hunger).

However, IPRs such as patents can be bureaucratic and restrictive and hence be detrimental to sustainable development in developing countries. The function of intellectual property rights (IPRs) in accomplishing the SDGs is scarcely noticeable in the program 4 (although it is highlighted in other places). Yet, the roles of technology and technological development are emphasized in many places in the SDGs. This illustrates the significance, intricacy, and uncertainty intrinsic to using IPRs as promotional instruments for SD. It further highlights potential additions and alternatives to IP security in enhancing innovation to improve SD. To this end, it is important to avoid overly simple methods – such as a “all-or-nothing” discussion concerning whether IPRs hamper resource access or promote innovation vital to SD –since the function and the effect of IPRs may vary in several ways.⁷

⁷ Ibid, 17.

3.0. A Short History of Intellectual Property

IP stems from developments in three separate societal areas: the technological, the legal and political, and the philosophical. The initial rules on IP were established for trademarks. However, it was the Republic of Venice that first introduced the idea of patent rights in the second half of the fifteenth century.⁸ The patent law, instituted in 1474, had a protective function in continuing innovation. Two years previously the Venetian printing industry was suffering. However, with the advent of patent law, printing became a progressively more active industry over the following two decades. In fact, Venice came to be seen as the center of the printing industry in the later years of the fifteenth century. The seventeenth century saw several European countries establishing patent rights, but it was England that instituted the ‘modern’ idea of IPRs by initiating a formal arrangement for patents and copyrights. The Statute of Monopolies awarded patent rights and transferred the power to decide individual rights to the judiciary from the monarch. Consequently, England is frequently identified as the birthplace for modern IP laws. As printing equipment developed and became more readily available, the Company of Stationers made a number of demands which were adopted during the legal enactment of the Act of Anne in 1709.⁹

This law formalized copyrights with the aim of promoting the printing of books beneficial to society, while additionally acting against counterfeiting. Authors and copyright owners were accorded a twenty-one-year copyright period for extant printed works and fourteen years for future works, having the possibility to prolong the copyright for a further fourteen years following the expiration of the initial period. With the growth of world fairs in the second half of the nineteenth century, patent laws were increasingly considered insufficient and new international laws aimed at resolving this issue became necessary. This resulted in the approval of the Paris Agreement in 1884, which specified industrial property and extended its scope to incorporate both agrarian and mining goods (Chang, 2001: 300).¹⁰

In the aftermath of the 1929 financial crisis and the Second World War, there was a growth in a social welfare form of economic liberalism resulting in the founding of a number of worldwide organizations, including the International Monetary Fund (IMF), World Bank, United Nations, European Economic Community, and General Agreement on Tariffs and Trade (GATT).¹¹ Between 1940 to 1970, antitrust rules became increasingly significant while patent-related concerns lessened in importance. Although a variety of industries were

8 May and Sell, *op.cit.*, 73.

9 Ibid., 75.

10 Chang, H.J. (2001). “Intellectual Property Rights and Economic Development: Historical Lessons and emerging issues.” *Journal of Human Development*, 2(2), pp.287-309.

11 Sonderholm, J. (2010, December). “Ethical issues Surrounding Intellectual Property Rights.” *Philosophy Compass*, 5(12), 1107-1115. Accessed Online November 2024: https://www.researchgate.net/publication/264734575_Ethical_Issues_Surrounding_Intellectual_Property_Rights

protected by government efforts against the consequences of US antitrust practices, the situation greatly affected the electronics industry. While American companies had originally developed technological innovations such as the transistor, the integrated circuit and video cassette recorder, the successful commercialization of these inventions was achieved by other nations, most markedly Japan. Japan's dominance of the consumer electronics market was clear by the latter part of the 1960s, with its focus on originally American electronic goods. US patent holder's rights began to be taken seriously after 1982, when courts started to deliver strong compensation convictions for infringement of patents. With the foundation of the Intellectual Property Committee (IPC) in March 1986, the aim was to construct partnerships between developed countries and construct the network needed for TRIPS to occur.¹²

The twentieth century saw the arrival of major international cartels controlling a large part of the patent and copyright systems. To regulate IPRs, two separate procedures were put into action. Internationally, organizations like the World Intellectual Property Organization (WIPO) and the World Trade Organization (WTO) made attempts to promote and authorize IP.¹³ From a local and national point of view, efforts were made to improve individual regard for IP combined with the endorsement of these rights. IPR protection, known as TRIPS, was introduced into the international trade system in the 1986 Uruguay Round of GATT. The Marrakesh Agreement, signed in Marrakesh, Morocco, by 123 countries on April 15, 1994, concluded the Uruguay Round. Under the agreement, nations are obliged to introduce laws that recognize computer programs as copyrighted products, and the scope of the patents must also include microorganisms and microbiological practices.¹⁴

These treaties have important economic and social effects for the countries involved. For example, the scope of TRIPS extends beyond patents, and imposes international specifications for the application of the different categories of IP, including trademarks, copyrights, industrial designs, geographical indications, and the layout designs of integrated circuits.¹⁵ This international IP regulation is required for countries seeking access to WTO membership and, consequently it requires countries to put IP protection laws into practice. These laws require software to be considered and protected identically to literary works. The significance of the Marrakesh Agreement rests in its effects on two of the foremost contemporary technologies;

12 Ibid., 27.

13 Bannerman, S. (2020, September). "The World Intellectual Property Organization and the Sustainable Development Agenda." *122 Futures*. Accessed Online December 2024: <https://thinkfide.com/wp-content/uploads/2021/02/Banermann-2020-IP-and-SDGs.pdf>

14 Ibid., p.22.

15 Transforming our World: The 2030 Agenda for Sustainable Development', United Nations – Sustainable Development knowledge platform, <https://sustainabledevelopment.un.org/post2015/transformingour-world> (accessed 23 March 2024).

the establishment of IPRs related to digital technology and biotechnology.¹⁶ To recap, the rise of IPRs can be ascribed mainly to economic, technological, and political requirements. Governments have applied IPR practices with the aim of both protecting national industries from outside competition and stopping fraudulent copies appearing on the domestic market.

4.0. Intellectual Property Rights

Intellectual Property can be defined as the intangible rights bestowed on an individual or company for the identification and the protection of their intellectual creations.¹⁷ IP rights offer sole economic rights from the perspective that they allow the holder the legal permission to forbid third parties from using the protected good or idea, or from employing some actions. In general terms four key IP rights exist within the European Legal system: - Trademark; - Patent; - Copyright; - Design; - Further protection rights connected to intellectual property. There are a variety of levels of Intellectual Property rights regulations. Firstly; the international level. For instance, the Berne Convention controls copyrights and allied rights, the Paris Convention controls patent rights, and the Madrid Agreement controls Trademarks.

These conventions describe the minimal standards that are required to protect the previously stated rights in each of the spheres of the contracting participants, and are controlled by the World Intellectual Property Office (WIPO).¹⁸ Equally, a worldwide agreement on Intellectual Property rights set by the World Trade Organisation (WTO) exists. This is known as the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS), which has benchmarks for minimum standards and sets out the parameters for the regulation of IP rights for international contracting members. Secondly, there is a national level of IP rights regulations, indicating the existence of a set of rules for each individual country. Lastly, there is the potential to regulate IP rights by applying a contract between parties, such as public parties or private bodies such as an individual or companies (Landes and Posner, 2003: 36).¹⁹

These separate regulatory levels for IP rights may complicate the achievement of an overall uniformized system. Taking the European Union as an illustration, it should be borne in mind that individual states can stipulate the use of their own rules and directions for the protection and recognition of copyright and, despite the European legislator striving to standardise the rights, a variety of European copyrights continue to exist. Trademark and Design are alone in

16 World Intellectual Property Organisation, 'Geographical Indications: An Introduction', World Intellectual Property Organisation, (Geneva 2017), 19. <https://www.wipo.int/edocs/pubdocs/en/geographical/952/wipo_pub_952.pdf>, accessed 13 April 2024.

17 WIPO, 'What is Intellectual Property?' World Intellectual Property Organization (Geneva 2015), <<https://www.wipo.int/about-ip/en/>> accessed March 2024.

18 Ibid, 26.

19 Landes, M. and Posner, R.A. (2003). *The Economic Structure of Intellectual Property Law* (HUP).

being liable to regulation both at a national level (by relevant state laws and European rulings aiming at co-ordinating those laws) and at a European level after the instigation of a Community Design and Community Trademark. As previously stated, a trademark is defined as a category of intellectual property right. It is a significant marker of a product's value by protecting its origin. Traditionally seen as an element of the private sector, trademarks were frequently gained by use, as opposed to by award of the state. However, developments in industry requirements and levels of competition necessitated modifications to the European trademark system in order for it to meet results of those changes (Drahoš, 2005: 24).²⁰ To accomplish this, a number of pieces of trademark legislation were gradually enacted, concluding with the formation of a European Community Trademark in 1993.⁶ This example demonstrates that laws - and particularly - trademark laws, have developed to meet society's needs.

5.0. The Role of IP in Sustainability

IP can be a key part of sustainability, but this differs according to the specific IP right considered.

5.1. Patents

Patents are a pivotal example of the role IP can play in sustainability. As a monopoly right, patents permit a Greentech company to license goods processes that increase sustainability (i.e. technological innovations), but create an income at the same time (Mandeville, 1996: 3).²¹ The method of requesting protection for a patent requires invention details to be revealed and this may permit others to profit from, and improve, the invention. Once a patent is awarded, the patent owner can stop illicit use of the invention for the period of the patent's validity, but once the patent has expired, the invention is available for general use. Where environmentally valuable inventions are concerned, this is clearly beneficial. Patents may be applied to safeguard (and, subsequently, reveal) key climate change reduction inventions for use in energy, construction and transport, in addition to environmental control and water-related adaptation technologies.²²

Modification innovations target cuts in greenhouse gas emissions, improvements in energy efficiency, the enhanced use of resources, a reduction in waste and progress in reuse and recycling of materials. Known as low-carbon technologies, they produce somewhat lower CO₂ emissions than energy from fossil-fuels. For instance, in the transport sphere, an electric vehicle would

20 Drahoš, P. (2005, October). "An Alternative Framework for the Global Regulation of Intellectual Property Rights." *Austrian Journal of Development Studies*, no. 1, p.24.

21 Mandeville, T. (1996). *Understanding Novelty: Information, Technological Change, and the Patent System*. Norwood, New Jersey: Abex Publishing Corporation.

22 Ibid., 9.

be a relevant example. Examples in energy generation could incorporate wind turbines, solar photovoltaic (PV) cells, and coal-powered power stations adapted to capture carbon. Further CO₂ removal and capture innovations, for instance power station storage capabilities, cut CO₂ emissions by capturing and collecting gases, which can be accomplished both in reservoirs (in rock spaces, underground or underwater) or in raw material like wood.

The World Intellectual Property Report 2022 notes that patent applications can be an important source of data in themselves. This is especially relevant for identifying developments in sustainability, which may later create of direction of technological innovation that organisations can develop further. For instance, WIPO's report highlights the dramatic rise in post 2000 patent applications for green technologies. Additional evaluation confirms an association with such renewable energy resources, as solar, wind and fuel cells, and perpetual batteries. As a result, developments in patent applications can be noted and appraised, providing an awareness of the future of technological sustainability.²³

Examples of sustainable innovation patents include Nike's application for patent protection for processes for using recycled plastics in creating footwear, and Allbirds, a clothing and footwear business, applying for a patent for a shoe that incorporates a 'continuous knit textile comprising eucalyptus fibre'. Patents are generally valid for 20 years, but they can spark a prolonged legacy far beyond their expiration. In 1871 Charles Goodyear, Jr. was granted a patent (US111197A5) for a machine that stitched footwear, allowing for the invention of the 'Goodyear Welt'. This production method is still currently in use, although with modifications over time. Due to the waterproof design of Goodyear welted footwear, they remain desirable, but furthermore, the unique structure also permits straightforward repairs or resoling. This benefit results in a longer life for shoes with a Goodyear welt, since they are more likely to be repaired, consequently reducing consumption and lessening the ecological and financial outlay for removal. Although environmental concerns were doubtless not Charles Goodyear's first thought when he invented his machine, the subsequent patent is an appropriate illustration of an early invention that became freely available for universal profit.²⁴

A significant number of patent applications regarding green/sustainable innovations, will ultimately benefit the world at large, being subject to regularly improvements/developments, and will play a role to the search for sustainable methods. There are, however, individuals holding an opposite viewpoint. It is their contention that patent rights hinder the common implementation of green/sustainable innovations. They state that if the monopoly right that a patent grants, is not accessible to others to develop further, for instance, via licensing, the

23 Henry and Stiglitz, *op.cit.*, p.239.

24 Arundel, A. (2001). "The relative effectiveness of patents and secrecy for appropriation." *Research Policy*, 30(4), pp.611-624. Accessed Online November 2024: https://www.researchgate.net/publication/222531614_The_Relative_Effectiveness_of_Patents_and_Secrecy_for_Appropriation

progress and uptake of sustainable methods may be unnecessarily hindered while awaiting the expiry of the particular patent. These arguments will be considered in further detail in this report.²⁵

5.1.2. The Repercussions for Developing Countries

Some contend that patents can prevent the adoption of green technologies because they can result in monopolies that, if not granted to third parties for exploitation, such as through licensing, could cause the development and adoption of sustainable practices to be unnecessarily delayed until the patent in question expires (Hitchens et al., 2024: 389).²⁶

But in developing or emerging regions such as sub-Saharan Africa, the innovation mechanisms that drive technological advancement are different from those in industrialised nations (Cirera & Muzi, 2020).²⁷ The repercussions of this for developing nations may be seen in how sustainable development is being sustained in Africa via the transfer of renewable energy technologies from China. China has facilitated technology transfer to African nations in the renewable energy sector through partnerships and agreements. This approach utilises both formal intellectual property rights mechanisms and informal knowledge sharing practices. This synergistic support will advance Integrated Development Goal 7 by making energy affordable and accessible.

Amankwah-Amoah and Medase (2023) have highlighted that rather than creating entirely new technologies, innovation in developing economies mostly takes the form of assimilating, adapting, and becoming proficient in previously created technology from other nations.²⁸ They explored potential pathways of appropriability that may enable enterprises to benefit from their innovative endeavours, considering the developmental difficulty faced by the majority of firms in the sub-Saharan African region and the growing significance of innovation to growth and development. Patents are one of the main indications of appropriation.

Scholars argue that there are a number of benefits and drawbacks to utilising patents

25 Ibid., 626.

26 Hitchens, B., Heard, C. and Vertes, J. (2024). "Sustainability and Intellectual Property in United Kingdom." Pranvera Këllezi, Pierre Kobel and Bruce Kilpatrick (eds.), *Sustainability Objectives in Competition and Intellectual Property Law*. Cham, Switzerland: Springer. 387-395.

27 Cirera, X. and Muzi, S. (2020). "Measuring innovation using firm-level surveys: Evidence from developing countries." *Research Policy*, 49(3).

Accessed Online November 2024: <https://ideas.repec.org/a/eee/respol/v49y2020i3s0048733319302306.html>

28 Amankwah-Amoah, J. and Medase, S.K. (2023). "Extracting Innovation Value from Intellectual Property: Evidence from sub-Saharan Africa." *Journal of the Knowledge Economy*, vol.15, 8933-8967. Accessed Online November 2024: <https://link.springer.com/article/10.1007/s13132-023-01225-9>

as a measure of innovation (Fritsch & Wyrwich, 2021).²⁹ Amankwah-Amoah and Medase (2023) bring attention to a report on IPR trends in Africa which demonstrates that non-resident grantees are becoming more prevalent than resident grantees in both resident and non-resident applications. The patterns demonstrate that awarding and maintaining IPR is not a linearly advantageous process. South Africa has the most applications out of all the countries that have been documented. South Africa received 5,429 patents in 1990; however, by 2010, that number had dropped to 1,468. In contrast, Morocco's patent grew from 302 to 915 between 1990 and 2010. Between 1990 and 2003, the number of patent applications in Egypt increased by over 2.5 times, but the number of patents issued remained relatively stable. Ethiopia, Madagascar, Mauritania, Morocco, and the Seychelles are among the other nations. The low number of grantees despite the large number of applications is partially caused by the patent offices' inability to keep up with the appropriation indicator's growing needs. Only four other nations registered more than ten (10) patents over a 12-year period, despite the fact that the number of Africans receiving patents from the USPTO stayed constant at 140 per year between 1997 and 2009. These nations are Zimbabwe, Nigeria, Tunisia, and Morocco.

In Germany for instance, the country manages to maintain a competitive advantage in renewable energy and environmental conservation. The German Renewable Energy Sources Act (EEG) and incentives for green technologies have fostered domestic innovation and contributed to the global popularity of renewable energy solutions (May 2010). This demonstrates the significance of intellectual property rights in achieving Sustainable Development Goal 7 (Affordable and Clean Energy) by Advancing clean energy technologies. It demonstrates that patent systems, in conjunction with government, assistance for innovation accelerate the transition to sustainable energy sources.

Moreover, in developed nations public research institutions have been increasingly patenting their developed technologies in alignment with the growth of patenting in the private sector. The introduction of the Bayh-Dole Act in 1980 in the US facilitated this approach, which has subsequently been adopted by other developed nations and, to a growing extent, by developing countries which are slightly more ahead than others when it comes to tech development. In the US, the number of US universities which each year are awarded patents has risen significantly, from fewer than 350 in the 1970s to over 3,000 in 2000. The proportion of patents awarded to academics in the United States has risen from 0.5% to 2% of the total during the specified timeframe. Yet this policy has, according to some, facilitated a surge of inventions from universities and enhanced their commercialisation, yielding broader economic advantages for society. Concerns arise regarding potential restrictions on how the public sector may interfere in priorities for research, access to research findings and their utilisation by others, and whether

29 Fritsch, M. and Wyrwich, M. (2021). "Is Innovation (increasingly) concentrated in Large Cities?" An International Comparison. *Research Policy*, 50(6). Accessed Online November 2024: https://pure.rug.nl/ws/portalfiles/portal/118418408/2020005_IO_def.pdf

the rise in patenting serves as a valid indicator of accelerated technology transfer.

In developing countries, the situation is in complete contrast. To prevent facing issues similar to those in developed nations, developing countries should create patent systems that consider their unique economic and social contexts. Legal frameworks and patent offices within developing countries must recognise the commercial and social implications of their chosen approaches to patent policy formulation and implementation. Developing countries with advanced technology may consider implementing systems that offer comprehensive patent protection to incentivise research and development. The concentration of scientific and technological expertise in the public sector of developing countries necessitates deep reflection about the role of both universities and research institutions when it comes to patents and their implications. Countries with inadequate scientific and technological infrastructure are less likely to implement extensive patent protection, as the majority of their technology is sourced from imports.

Secondly, a significant challenge involves reconciling the interests of developing countries with the prevailing pressures to align the international patent system with the standards established by developed countries. The Commission on Intellectual Property Rights (2002: 132) noted an example in Kenya, regarding a controversy around a patent for an HIV vaccine submitted by the Medical Research Council (MRC) in the UK.³⁰ Concerns were raised regarding the insufficient recognition of the contributions made by researchers at the University of Nairobi towards the invention claimed in this patent. Due to public pressure related to this case, an agreement was established in which the MRC, the University of Nairobi, and the International Aids Vaccine Initiative (IAVI) would collectively own this patent and any future patents associated with this development. Without such an agreement, the researchers from Kenya would have needed to contemplate legal action to secure their rightful entitlement to the patent or any benefits arising from its potential exploitation. More recently, Mattsson (2022: 33) observes that numerous developing countries endorsed a patent waiver for the COVID-19 vaccine to address issues of unequal distribution and overall availability in these regions. The disparity in vaccination rates highlights the urgent need for solutions. By the time 10% of Indians had received a single dose of the COVID-19 vaccine, over 50% of US citizens were vaccinated. Furthermore, by early May 2021, the United Kingdom had administered 55 million doses, while Africa had only administered 19 million doses in total.³¹

30 Commission on Intellectual Property Rights (2002). *Integrating Intellectual Property Rights and Development Policy*. London: Commission on Intellectual Property Rights. Accessed Online August 2024: http://www.iprcommission.org/papers/pdfs/final_report/ciprfullfinal.pdf

31 Mattsson, J. (2022). *Sustainable Development Goals in the Light of Intellectual Property Rights and Competition Law*. Unpublished MA Thesis. University of Helsinki. Accessed Online August 2024: <https://helda.helsinki.fi/server/api/core/bitstreams/af8827bc-2258-43df-bedb-d4bba2a954d9/content>

5.1.2.1. Green Tech Innovation, Developing Countries and IP

Green patents protect technologies that provide environmentally friendly solutions and encourage developments that support environmental sustainability. Since 2000 there has been a rapid rise in patents filed in clean technologies. These include water-saving, waste-reduction, energy-efficient, and sustainable transportation technology. By granting exclusive rights to these environmentally beneficial technologies, these patents incentivise businesses and investors to invest in sustainability research and development. Businesses may be encouraged to invest in sustainable solutions by the combination of financial incentives and intellectual property protection. IP-protected green technologies and procedures can boost consumer preferences, draw in investments, and provide businesses a competitive edge. IP protection gives businesses a competitive edge in the market by allowing them to profit from their ideas that are sustainability-focused.

The adoption of new green technologies by developing countries is noted by the Kyoto Protocol which highlights that developing countries are not obliged to reduce greenhouse gas emissions unless they receive sufficient funding and tech from developed countries (Singh and Srivastava, 2022). Singh and Srivastava (2022)³² for instance have discussed in their book *Patent Law, Green Technology and Innovation* that there is a rise of green patenting in India. Singh and Srivastava also note that China is the only non-OECD country to have a decent share of patent filings.

While Dutfield and Suthersanen (2015)³³ note that India is recognised as a significant contributor to the global supply of generic drugs, especially in the treatment of HIV/AIDS, tuberculosis, and malaria. This is primarily attributable to India's patent laws, specifically, Section 3(d) of the Indian Patents Act which mandates that for an invention to be patentable, it must demonstrate significant improvements that differentiate it from anything beforehand.

This gulf between developing nations and OECD nations when it comes to patents needs to be addressed, this means ensuring that developing countries have stronger mechanisms in place.

5.2. Trade Secrets

Trade secret protection is significant when it comes to subsidising research and development and also for maximising economic growth (Burgunder, 2001: 199).³⁴ In order to distinguish trade

32 Singh, A. and Srivastava, Y.K. (2022). *Patent Law, Green Technology and Innovation*. Abingdon, Oxon and New York, NY: Routledge.

Dutfield, G. and Suthersanen, U. (2015). *Global Intellectual Property Law*. Cheltenham, Glos and Northampton, MA: Edward Elgar

34 Burgunder, L.B. (2001). *Legal Aspects of Managing Technology*. Mason, Ohio: Thomson South-Western.

secrets from ‘skill and knowledge’ some courts utilise the *nature of knowledge* as a measure. In this way, Suñol notes (2013)³⁵ *objective* knowledge is distinguished from *subjective* knowledge (ability, aptitude, skills).

Recent years have shown IP reform to be concentrating on EU trade secrets (including those in the United Kingdom). After the implementation of the Trade Secret Directive 2016/ 943 in 2016, many EU states and the UK have updated their national security procedures by means of the Trade Secrets (Enforcement, etc.) Regulations 2018 (SI 2018/597). In the UK, trade secrets law supplements the fair cause of action of breach of confidence. It is possible to apply trade secret protection for information that is not commonly identified, available on the market and valuable due to its classified nature (Zografos, 2010: 14).³⁶ As a result, not only green inventions qualify for trade secret protection, but also commercial or economic data. There is no registration procedure, but the owner of the trade secret should have instigated realistic protection measures in order to maintain secrecy.

The Regulations determine that protection applies only against illegal purchase, release or use of the material—not the actual ‘content’. As one of these three actions is sufficient for a violation to be deemed to have occurred, it is feasible that infringement may occur in situations where a legally purchased Trade Secret was later illegally employed or revealed. Common law/equity, threatened or actual unsanctioned exploitation of restricted information can be seen as a breach of confidence. Moreover, in situations where a receiver of information acquires that material ‘lawfully’, by finding seemingly scrap documents in a public location, the successive release of the information may still comprise a breach of confidence, if the receiver is concretely aware of its secrecy.³⁷ It can therefore be said that trade secret protection is patchy (and more difficult to implement) when contrasted with available protection of patents. Yet, the trade secrets administration/breach of confidentiality may be particularly valuable in the steps that come before the patent protection is acquired, or as ‘additional’ protection, e.g. for factors that need not be revealed in a patent registration.³⁸

A business’s most valued assets may be its store of secret information and trade secrets. A business’s competitive market edge may hinge on having particular information unavailable to competitors, and the ability to preserve that secrecy. It may prove preferable to handle a sustainable technological invention in confidence, in situations where it may not be possible to patent an invention, or it may be challenging to enforce confidentiality, such as when trying

35 Suñol, A. (2013). “Trade Secrets vs Skill and Knowledge.” Stefan Grundmann, Fabrizio Caffagi and Giuseppe Vettori (eds.), *The Organizational Contract: From Exchange to Long-Term Network Cooperation in European Contract Law*. Abingdon, Oxon and New York, NY: Routledge. 197-231.

36 Zografos, D. (2010). *Intellectual Property and Traditional Cultural Expressions*. Cheltenham: Edward Elgar.

37 Ibid., 18.

38 Ibid., 20.

to demonstrate a competitor making use of an innovation. There is also substantial licensing potential for the technological transfer of important knowledge combined with supplementary IP rights, which includes patents.³⁹ This can allow the commercialisation of green technology know-how via a third party or shared provision, such as that envisioned by WIPO GREEN. WIPO GREEN is an online technology exchange platform, managed by the World Intellectual Property Office. It assists international attempts to resolve climate change by connecting suppliers and seekers of ecologically friendly innovations. Its database, links and development projects help to further the growth and distribution of green technology invention. Examples of significant and private confidential material or trade secrets in this situation incorporate source code and algorithms for food source tracking applications or access to reserves of clean water (Oguamanam, 2012: 143).⁴⁰

AI creations and the data/datasets that inform those outputs are likely to be critical to the world's ambitions to deliver a sustainable future. Raw data will enable technological innovation to be driven by statistical analysis. Although it is widely agreed that data will be particularly valuable, and while it is possible to protect databases, via database rights, at present no 'traditional IP' protection system exists that sufficiently covers the actual data. This follows the notion of the idea/expression dichotomy. The idea/expression dichotomy is a deep-rooted principle underpinning IP law, that is that while it is not possible to protect founding ideas, the written expression of the ideas can be (Colyvas et al., 2003: 29).⁴¹ Subsequently, the trade secrets and confidential information companies are central to the safeguarding and exploitation of IP in the sustainable innovation context.⁴²

5.2.1. Balancing Secrecy with Innovation and the Ethical Considerations of Trade Secrets

There can be ethical implications around deciding to patent an invention or keep it a trade secret. The issues in regard to patents and trade secrets, are that patents require disclosure of the invention which means fosters innovation by being transparent and sharing knowledge. On the other hand, keeping an innovation as a trade secret, although providing a competitive advantage, does not advance the wider knowledge base. Thus, to what extent is keeping an invention or idea a secret contributing to technological development and collaboration? Neethu

39 Latif, A.A. (2015). "Intellectual Property Rights and the Transfer of Climate Change Technologies: Issues, Challenges and Way Forward." *15 Climate Policy*, 103–126.

40 Oguamanam, C. (2012). *Intellectual Property in Global Governance*. Abandon, Oxon and New York: Routledge.

41 Colyvas, J., Gelijns, A. and Rosenberg, N. (2003). *Economics, Law and Intellectual Property Seeking Strategies for Research and Teaching in a Developing Field*. Springer.

42 Ibid, 31.

(2019) suggests that secrecy can be an effective tool to enable the exploitation of research.⁴³ Yet secrecy is the main tool used to stop access to information as opposed to being a catalyst for sustainable clean and green tech innovation (Sandeem and Levine, 20:353), nevertheless it can be deployed appropriately to encourage new tech developments.⁴⁴

Furthermore, for developing countries there are serious ethical considerations particularly around accessing trade secrets and patented technologies. Companies which hold patents for life-saving drugs are scrutinised when developing countries are effectively restricted due to being unable to afford such medication. Hence, guarding trade secrets in such a rigid manner can prevent both fair competition and knowledge transfer, particularly in industries that are based on collaborative innovations.

Although when it comes protecting innovations in AI around datasets and algorithms trade secret protections are feasible choices, ensuring the secrecy of these assets in an open innovation and collaborative environment will remain a challenge. Some ways in which this can be remedied are as follows:

- Adopt ethical guidelines for AI usage and development, including transparency in how AI systems operate. This can help to build credibility and trust, thereby complementing IP protection approaches.
- Ensuring that protections are fair and effective via advocating for legal reforms in the form of engaging in discussions with both industry stakeholders and policymakers to guarantee that the specific challenges posed by IP legislation and AI are brought to the fore.
- Explore the possibility of blending trade secret laws with patent and copyright protections to be applied to various parts of AI.
- Formulate transparent and succinct agreements for licensing terms and IP ownership for AI technologies and AI-generated outputs

When it comes to AI, existing legal frameworks have to be amended as they were not initially devised when AI was popular. Moreover, as AI is now international there has to also be legal cooperation across states in order to develop appropriate protections. Also, tech developments must not be hampered by IP laws and hence ensuring a collaborative environment for AI is important and getting the right balance between facilitating innovation and IP protections.

43 Neethu, R. (2019). *Governing Intellectual Property Rights Within Publicly Funded Biobanks*. Frederick, MD: Wolters Kluwer.

44 Sandeen, S.K. and Levine, D.S. "Trade secrets and climate change: uncovering secret solutions to the problem of greenhouse gas emissions." (2016). Joshua D. Sarnoff (ed.), *Research Handbook on Intellectual Property and Climate Change*. Cheltenham, Glos and Northampton, MA: Edward Elgar. 352-369.

One way which could be maximised for developing countries, is what was suggested in a developed country for underprivileged communities. David Kappos, the former Undersecretary of Commerce and Director of the United States Patent and Trademark Office (USPTO) stated that the, Economic security of this country and its minority communities continues to depend on its ability to innovate.

Hence, the USPTO initiated a number of projects in order to make the patent and trademark registration system more accessible to low-income communities along with free and low-cost IP legal services, in this way encouraging a fairer economic environment. Such initiatives could be rolled out on a macro-level for developing countries, underpinned by international legal support. Lawyers and legal experts could also provide entrepreneurs in developing countries with IP law literacy education advice to prevent exploitation and investments (Heimes, 2015:134).⁴⁵

In summary, the ethical management of trade secrets and patents is a complex process that necessitates striking a balance between the preservation of intellectual property, the advancement of fair competition, and the larger interests of society. Businesses and individuals must negotiate these complications with a strong dedication to moral values, making sure that their actions promote creativity, uphold the rights of others, and develop society.

5.3. Trademarks

Trademarks are the most pervasive form of IPR around the world and are common in developing and middle-income countries (Castaldi and Mendonça, 2022).⁴⁶ Trademark authorisation is awarded to images that indicate the commercial source of distinctive products and services. Such images may incorporate not only text or logos, but also three-dimensional shapes, patterns or colours, sounds or surface formations. Trademark authorisations are easily acquired using an online process overseen by the United Kingdom Intellectual Property Office (Gough, 2015: 145).⁴⁷

Furthermore, the United Kingdom grants national unrecorded rights to signs that profit from benevolence/reputation via the law of passing-off. Trademarks have a stabilising function in sustainability. They guarantee that words describing sustainable practices remain freely available for all traders, guaranteeing that no one is excluded from employing such words to

45 Heimes, R.S. (2015). "Lawyers and innovations." Lateef Mtima (ed.), *Intellectual Property, Entrepreneurship and Social Justice: From Swords to Ploughshares*. Cheltenham, UK and Northampton, MA, USA: Edward Elgar. 119-140.

46 Castaldi, C. and Mendonça, S. (2022). "Regions and trademarks: research opportunities and policy insights from leveraging trademarks in regional innovation studies." *Regional Studies*, 56(2), 177-189. Accessed Online November 2024: <https://www.tandfonline.com/doi/full/10.1080/00343404.2021.2003767#abstract>

47 Gough, M. (2015). "Reconciling Livability and Sustainability: Conceptual and Practical Implications for Planning." *Journal of Planning Education and Research*, 35(2), 145-160. Accessed Online November 2024: https://www.huduser.gov/portal/sites/default/files/pdf/2015_VCU_Gough_Journal-of-Planning-Education-and-Research.pdf

sell their own innovations. Without this, development in the field would be stifled and limited. Further, trademark protection administration permits businesses to highlight particular words/logos as distinguishing symbols of origin, promoting brand recognition and loyalty, thereby inspiring growth and allowing further investment in the expansion of sustainable practices. Trademarks often achieve further functions than revealing commercial origins. They express attitudes, values or expectations—of both product and consumer. Therefore, trademarks are crucial in illustrating a product's environmentally friendly nature, by use of words such as 'green', 'eco' or 're' for recycling, even though the scope of protection afforded by such terms is limited. Therefore, trademarks have a key function in the context of sustainability. Indeed, brand owners already leverage trademarks to connect particular 'green' values to their products/services and communicate them to customers (May, 2000: 67).⁴⁸

5.4. Copyright

As with a range of IP rights, copyright is fundamentally non-committal regarding a product's sustainability. Yet, it is clear that copyright still has its function. Given the current digital age, a large amount of high-tech innovation is computer-driven. It is therefore possible to safeguard software/algorithms whose function is to analyse and aid the development of further sustainable industrial procedures/frameworks.⁴⁹ for example, by using computer-driven solutions to develop tools and production methods that are more energy or environmentally efficient. Being a licensable right, the potential exists for copyright-protected software to be commercially available via a licensing model. The potential to create income from software will motivate designers to develop additional solutions and/or enhance current products. However, the idea/expression dichotomy and the nonexistence of ideas and use protection in the computer software industry, means that rightsholders are incapable of unethically leveraging their rights to stop competition/speculation by other parties in the same industry. The current UK toolkit of IP rights is well prepared to protect software focused innovation, both within the green sector and in other fields. However, it is believed that two major trends will lead future sustainable innovation: Artificial intelligence and big data. Is it also possible to safeguard this type of results?⁵⁰

Copyrights, another kind of intellectual property, protect, for instance, educational materials that contribute to improvements in the delivery of high-quality education worldwide.

48 May, C. (2002). *A Global Political Economy of Intellectual Property Rights: The New Enclosures*. Abingdon, Oxon and New York, NY: Routledge.

49 Landes and Posner, *op.cit.*, p.112.

50 Ibid., p.113.

6.0. Concept of Sustainability Towards Intellectual Property Rights

According to the World Economic Forum, some of the primary dangers to current society are pollution, climatic change, and waste management. One proposal to address these challenges is to incorporate the idea of sustainability into everyday life, which can encourage significant paradigm change and, consequently, address climate change. Sustainability, as defined by the Brundtland Commission in 1987, is an umbrella term that conventionally covers, three areas: social, financial and environmental.⁵¹ These are commonly recognised as the three ‘pillars’ of sustainability. While the 1987 definition ignited the political momentum towards the achievement of a greater level of environmental social sustainability, it can be considered somewhat vague and its aims unclear. By the early 2000s, however, the definition of sustainability had been refined to meaning

...the development that meets the needs of the present while safeguarding Earth’s life-support system, on which the welfare to current and future generations depends.⁵²

Internationally, a variety of political drives towards sustainability have been noted. The most prominent example is Agenda 2030 of the United Nations (UN) which was approved in 2015. This agenda comprises 17 Sustainable Development Goals (SDGs) and 169 sub-targets that UN member states have committed to work towards with the aim of achievement by 2030.⁵³

The extent of the SDGs is broad and covers a range of aims, from the eradication of poverty and hunger to evolving more sustainable urban areas. Despite the wide scope of aims, a central focus on environmental protection and, more generally, the reduction of climate change remains.⁵⁴ For instance, SDG 13 declares ‘Take urgent action to combat climate change and its impacts’ which shows an explicit link between the methods and programs adopted in the setting of this objective and the battle against Climate Change. Yet, it is also possible to see other SDGs as contributing to the fight against Climate Change, albeit less directly. Goal 12 is representative of this, as it states ‘Ensure sustainable consumption and production patterns.

51 Bannerman, *op.cit.*

52 WIPO (2020). *WIPO’s contribution to the implementation of the Sustainable Development Goals (SDGs) and its associated targets*. CDIP/25/6. Accessed Online September 2024: https://www.wipo.int/edocs/mdocs/mdocs/en/cdip_25/cdip_25_6.pdf

53 WIPO (2019). *Innovation Driving Human Progress: WIPO and the Sustainable Development Goals*. Accessed Online September 2024: https://www.wipo.int/edocs/pubdocs/en/wipo_pub_1061.pdf

54 Groose Ruse-Khan, H. (2010). *Sustainable Development in International Intellectual Property Law: New Approaches from EU Economic Partnership Agreements?* ICTSD’s Programme on IPRs and Sustainable Development, Issue Paper No.29, International Centre for Trade and Sustainable Development, Geneva, Switzerland. Accessed Online November 2024: <https://felixpena.ar/contenido/negociaciones/anexos/2010-10-sustainable-development-in-international-property-law.pdf>

While there is no clear statement targeting Climate Change, waste disposal, particularly of batteries and electronic devices, is a notable source of pollution in Europe. Indeed, the average European produces 5 tonnes of waste annually. Consequently, it can be possible to claim that SDG 12 has a strong link to the battle against Climate Change. The incorporation of sustainability in the European Union began with the addition of the TEU and TFEU, and resulted in a legally binding Charter of Fundamental Rights. The most recent step can be ascribed to the European Green deal, enacted in 2019.⁵⁵ The EU has agreed to emphasise Clean Energy, Sustainable Agriculture, Biodiversity and Sustainable Industry. importance is placed on sustainable development within the environment. Targets 1, 2 and 3 aim to further a society with a higher level of environmental sustainability.⁵⁶

6.1. The International Centre for Trade and Sustainable Development (ICTSD)

The International Centre for Trade and Sustainable Development (ICTSD) is an NGO with an important role in extending the IP and the sustainable development debate internationally. Established after the 1995 Earth Summit, The ICTSD was created with the aim of furthering sustainable development via trade focused policy development. Since its inception, it has incorporated in its work the part IP plays in sustainable development. Between 2001 and 2018, the ICTSD in partnership with the United Nations Conference on Trade and Development (UNCTAD), was able to pinpoint mutual economic and social issues where IP was of special relevance. Among the key areas was the adoption of IP systems to foster innovation and invention in developing nations; the development of the part played by technologies (biotech and ICT) and widespread technology transfer (Haggart, 2008: 218).⁵⁷ Regarding economic and social topics, the efforts highlighted food, agriculture and biodiversity; TK and traditional stories; and access to education, scientific and technical information in addition to climate change, as discussed further in this article.⁵⁸ The ICTSD was pioneering in elaborating the links between IP and sustainable development. Acting as a facilitator and knowledge center working towards overseeing sustainable development in global innovation and IPR negotiations, while also encouraging developing nations to create their own policies on IP and innovation to support their development objectives. The results of this work, including discussions, reports and a large amount of policy- oriented research, all discussed in this chapter, represents a fair example

55 Osofsky, H.M. (2003). "Defining sustainable development after Earth Summit 2002." *Loyola of Los Angeles International and Comparative Law Review*, 26(1), article 6, 111-125. Accessed Online November 2024: <https://digitalcommons.lmu.edu/cgi/viewcontent.cgi?article=1562&context=ilr&httpsredir=1&referer=>

56 Ibid, 94.

57 Haggart, B. (2008). "What is Intellectual Property?" Mathew Callahan and Jim Rogers (eds.), *A Critical Guide to Intellectual Property*. London: Zed Books. 217-238.

58 Ibid., 219.

of attempts made to develop sustainable development within the IP framework.⁵⁹

Mainly conducted via discussions in Geneva, its most important and long-term involvement in IP and sustainable development, was the publishing of a sequence of discussion papers, research and books, incorporating universal topics to precise ideas such as technology transfer, a number of health topics including nutrition, GRs and TK and more widely the extent of the TRIPS Agreement on developing nations (Karachalios et al., 2013: 23).⁶⁰ It was the ICTSD's interdisciplinary and fact-based methodology which produced its outstanding contribution in the IPRs area, rather than the conventional approach of evaluating IP from a limited legal perspective. This groundbreaking approach was subsequently repeated in projects such as the WIPO Development Agenda and its application. The WIPO Secretariat also put this method into practice, for instance in the 2009 creation of an economic group supervised by a Chief Economist. The aim of this division was to widen the extent of the Organization's remit beyond the conventional legal core, in addition to creating a Global Challenges Division while responding to challenges such as food security, biodiversity and climate change.⁶¹

A key illustration of the ICTSD's work concerns discussions on IP and climate change. In 2007, ICTSD released a fundamental report that analyzed empirical evidence concerning whether IPRs were hindering the dissemination of renewable energy technologies to developing nations. John Barton's report, *Intellectual Property and Access to Clean Energy Technologies in Developing Countries*, has been extensively cited. Expanding on the preliminary conclusions of this report, ICTSD later collaborated with the European Patent Office (EPO) and the United Nations Environment Program (UNEP) in an innovative cooperative work to undertake extensive mapping of IPRs in environmental technologies. It was the earliest EPO mutual agreement to be reached with an NGO. The ultimate report, *Patents and Clean Energy: Bridging the Gap Between Evidence and Policy*, demonstrated itself to have a significant impact on the UNFCCC procedure on technology transfer by demonstrating evidence that could better effectively contribute discussions on IPRs and climate change.⁶²

This venture generated the evolution of the EPO Y02 classification system, which included climate-change reduction innovations and the Y04S system for smart grids. Further developments followed, including further frameworks such as INSPIRE, created by the International Renewable Energy Agency (IRENA) and offering cutting edge material on

59 Chang, *op.cit.*

60 Karachalios, K., Abdel Latif, A. & Simmons, B. (2013). "UNEP-EPO-ICTSD Patents and Clean Energy." In Andree Kirchner & Iris Kirchner-Freis (eds.), *Green Innovation and IPRs Management*. Alphen aan den Rijn: Kluwer Law International.

61 Ibid., 26.

62 Ibid, 30.

renewable energy patents and standards (both developed in cooperation with the EPO). These classification systems seek to enable access to this specific type of patent data, especially for those without an expert knowledge of patents non-patent experts. Building on health and IP discussions, valuable impacts were also made concerning that experience regarding discussions on climate change and what similarities might be found between the two fields.⁶³

6.2. The Intersection between IPR and Sustainability

There is a continuing wide-ranging discussion about the effect of patents on innovation, and the ensuing part they play in the ecological economic rejuvenation. Far less discussion is devoted to the role that trademarks can play, despite their economic and legal significance (Hoang et al., 2020:).⁶⁴ For instance, industries dependent on trademarks make up 37% of EU GDP. Thus, the question about the adequacy of trademark law's ability to meet the needs of a sustainable society's needs persists: The neutrality of Intellectual Property rights in the case of sustainability is generally understood. Patent law is also seen as technologically neutral in that it offers no particular benefits to sustainable technologies over other technologies.

Equally, the essence of a trademark does not advocate sustainability. Yet, with the enactment of the European Green Deal and its ensuing aims and objectives, it can be concluded that future European innovations will meet these standards, and existing goods may need adaptation in order to do so. Subsequently, some examination of intellectual property rights is needed, particularly as trademarks could be more appropriately tailored to meet the needs of sustainable development (Karjala, 2012: 62-64).⁶⁵

It is commonly understood that a strong level of IPR security results in greater motivations for producers. However, from a sustainable development perspective it is impossible to claim that IPRs, and to an even greater extent trademarks, currently support sustainable products. One trademark sustainability challenge is the fact that goods using parts trademarked as a raw material may be seen as violating the trademark holder's right. It may be seen that such a distinctive case is included in the doctrine of exhaustion, which states that once a product has appeared on the market, the trademark has achieved its purpose, and the product may be freely distributed. Nonetheless complications remain (Pila and Torremans, 2016: 4).⁶⁶ In cases

63 World Intellectual Property Organisation (2021). *PCT Yearly Review 2021: The International Patent System*. Geneva: WIPO, 28.

64 Hoang, G., Thi Le, H.T., Nguyen, A.H. and Thi Dao, Q.M. (2020, June). "The Impact of Geographical Indications on Sustainable Rural Development: A Case Study of the Vietnamese Cao Phong Orange." *Sustainability*, 12(11), 1-13.

65 Karjala, D.D. (2012). "Sustainability and Intellectual Property Rights in Traditional Knowledge." *53 Jurimetrics*, 57-70.

66 Pila, J. and Torremans, P. (2016). *European Intellectual Property Law*. Oxford: Oxford University Press. 2nd Edn.

of recycling, for instance, a trademark on products is an obvious barrier to their recycling. The holder of the trademark could state Article 10(2)(a) and 10(2)(b) if a significant resemblance exists between the protected product and its recycled competitor. The quality of the recycled product could also permit the right holder to rely on Article 15(2).

A further challenge between sustainability and trademark protection is the area of upcycling, where waste materials are used to construct new products to the extent that the original raw material (waste) is recognisable. Unlike the recycling example, it is doubtful that Article 10(2)(a) and Article 10(2)(b) could be raised by the holder of a trademark to avert the upcycling from occurring, as the subsequent product is frequently distinct from the original trademarked product. Nevertheless, it remains possible for the trademark holder to invoke Article 10(2)(c) in order to protect the trademark. Furthermore, the CJEU conferred a robust level of protection on the image of designer brands in respect of the doctrine of exhaustion, which seemingly allows little room for the issue of sustainability. Commonly, EU trademark law focuses on the question of whether a trademark's purpose is infringed by certain uses.⁶⁷ By applying numerous examples of case-law, the CJEU, has created a range of rules to establish situations when the third-party use of a trademark adversely marks the trademark holder's image.

Moreover, the CJEU also affirmed in *Adam Opel* and *Adidas* that with regard to products that are similar to original trademarked products, it is only the use of a trademark which lies within the constraints of Article 14(1) of the Trademark Directive. In this way, the use of a trademark for an ornamental purpose does not lie within the limit offered by that article. However, regarding specific sustainability matters, there is insufficient CJEU case-law concerning trademark violation, and still less regarding the reuse or upcycling of manufactured goods that are constructed from trademarked raw materials. Yet despite this absence of judgements, it is still possible to extrapolate past decisions and the present EU political plan, to recognise how existing trademark law could be construed in future cases to offer sustainable development a more robust position.⁶⁸ The present situation of trademark law and CJEU decisions regarding trademark protection offers little opportunity for the development of sustainable innovation, since the trademark holder could rely on their privileges to thwart such actions if they consider it unbecoming towards the image of their brand. Therefore, it continues to be important to appreciate that a trademark holder's economic rights may require some adjustment to allow such the encouragement of sustainable initiatives, since they contribute significantly to a reduction of waste, which in turn, supports the achievement of numerous sustainable EU objectives (Pila and Torresman, 2016: 4).⁶⁹

In addition, sustainable development plays a part in the dissemination of green technology.

67 Ibid, p.14.

68 Ibid, p.23.

69 Ibid., p.4.

The 1992 Earth Summit advocated the transfer of environmentally sound technologies (ESTs) to developing nations. Chapter 34 of Agenda 21 centered entirely on the transfer of ESTs and contained a number of IPR provisions. These provisions underscore the necessity of encouraging developing nations' access to unpatented technology, or to public domain innovations. Additionally, they also emphasize the need for access to technologies patented via procedures like mandatory licensing, i.e. the government granted approval permitting a third party to manufacture the patented invention or procedure without the need for the patent owner's consent. The CBD also considered IPRs. Article 16(5) of the CBD asserts that, contracting parties, recognizing that patents and other intellectual property rights may have an influence on the implementation of this Convention, shall cooperate in this regard subject to national legislation and international law in order to ensure that such rights are supportive of and do not run counter to its objectives (Abbot, 2009: 13).⁷⁰

Generally speaking, the IPRs recommendations in Agenda 21 and the CBD were contentious and are understood to be one of the justifications for the United States (US) not endorsing the CBD. Over time, the concern that IPR may be an obstacle to the transfer of technology became increasingly difficult to many developed nations. The resulting text of the Rio+20 Conference (2012) is merely a 'memory' of the specifications on technology transfer, information access, economics and IPRs as settled a decade before in the Johannesburg Plan of Implementation (2002). Moreover, the TRIPS Agreement is referenced only in regard to access to medication, not in regard to environmental technology transfer.⁷¹

From the climate change viewpoint, the divided opinions on the potential role of IPRs in climate change technology dissemination continue to be unresolved. This is despite the UNFCCC agreement to establish a Technology Mechanism (TM) to improve the dissemination of technology to lower and adapt to climate change. The Paris Agreement (2015) overlooked 201015 IPRs. The stalemate is the result of the differing opinions on the function of IPRs in augmenting and disseminating climate friendly technology. Several developing nations have put forward the opinion that IPRs create obstacles to the wider distribution of this type of technology and reasonably priced access to it. Numerous developed nations consider IPRs to be a vital motivation for innovation, diffusion and dissemination. As previously stated, IP is largely lacking from the 2030 Agenda for Sustainable Development, which crucially offers a comprehensive structure for international innovation in sustainable development.⁷²

70 Abbott, F. (2009). *Innovation and Technology Transfer to Address Climate Change: Lessons from the Global Debate on Intellectual Property and Public Health*. ICTSD Programme on Intellectual Property Rights and Sustainable Development, ICTSD.

71 Ibid., 26.

72 World Intellectual Property Organisation, 'Geographical Indications: An Introduction', World Intellectual Property Organisation, (Geneva 2017), 21.
< https://www.wipo.int/edocs/pubdocs/en/geographical/952/wipo_pub_952.pdf >, accessed 13 September 2020.

7.0. Discussion on How Intellectual Property Rights Can Achieve Sustainable Development

Intellectual Property Rights (IPRs) can aid in the drive for sustainable development: Firstly, intellectual property rights are a mechanism to spread key inventions. This is vital for sustainable inventions or those that encourage sustainable development. One feature of intellectual property rights, and is particularly relevant to patents, is disclosure. Indeed, if an invention is not fully disclosed, the patent for that innovation is void. This demonstrates that as per international patent legislation, despite a patent owner holding monopoly rights to the invention and being able to limit the use of the innovation or its details, he must reveal such details to the public in full, to allow future developers to be aware of the innovation and resulting or patented information.⁷³

Additionally, as patent owners have the monopoly rights for an innovation and are able to limit access to the invention in any manner they choose, they are able to apply this right in a manner that allows earlier and wider distribution of the invention. Such instances have occurred. For instance, in 1973, Boyer and Cohen developed a process for injecting pieces of DNA from an organism into bacteria in a manner that both bacterium and its progeny develop the ability to yield proteins that are traditionally created in the original organism. In principle, they uncovered a method to transfer genetic material from one organism to a second.⁷⁴ Boyer and Cohen took out a patent for this original genetic engineering procedure and established that interested individuals would have the possibility of purchasing a license at a realistic price, meaning there would be no monopoly of licenses. Non-exclusive licenses were established for their patent. They also offered free exploitation of the method in cases of nonprofitmaking studies. In essence this created a mutually beneficial situation, since the royalties generated satisfied the scientists, and of more fundamental importance to humankind, their innovative method has seen faster distribution (May, 2000: 47).⁷⁵

Consequently, several highly constructive inventions and innovations have evolved from their method, including a vaccine for hepatitis-B, human growth hormone and insulin. The biotech industry can be said to have developed from their methods, resulting in enormous achievements. Intellectual property rights strengthen innovation distribution, significantly accelerating the uptake of sustainable processes and innovations, all to the betterment of society (May, 2000: 49).⁷⁶

73 WIPO Intergovernmental Committee on Intellectual Property and Genetic Resources, Traditional Knowledge and Folklore, 'Technical Study on Disclosure Requirements in Patent Systems Related to Genetic Resources and Traditional Knowledge' [2004] Technical Study was made available to the seventh meeting of the Conference of the Parties in Kuala Lumpur, Malaysia in (2004), 31.

74 Ibid, 19.

75 May, C. (2000). *A Global Political Economy of Intellectual Property Rights: The New Enclosures?* Abingdon, Oxon and New York, NY: Routledge.

76 Ibid, 49.

IPRs can further aid in the promotion of sustainable development by means of the Trade Related Aspects of Intellectual Property Rights (TRIPS) Agreement, which was agreed in 1994. It encompasses a wide range of Intellectual Property Rights, including trademarks, copyright, industrial designs geographical indications, patents, and so on. The TRIPS Agreement specifies minimum safeguarding requirements to be ensured by each confirming Member. The TRIPS Agreement includes many conditions that improve sustainable development by means of IPRs. For example, it grants that innovations that "...protect human, animal or plant life or health, or avoid serious prejudice to the environment..." should be disqualified from being patented (Attas, 2008: 32).⁷⁷

The phrase 'avoid serious prejudice to the environment' can be understood as including innovations that encourage sustainable development, specifically in the sphere of the environment. The Agreement's parameters specify exceptions to monopoly patent rights. Numerous additional requirements are included, such as endorsing a more effective distribution of technological innovation. An example of this is the authorization of technologically advanced nations to offer incentives to companies to share innovations with less developed nations. This can stimulate information sharing, which is a key factor in promoting sustainable development. Nonetheless, it is important to note that the requirements of TRIPS are unenforceable, and it is the decision of the members of the Agreement whether or not to apply the requirements in any way they choose (Abbot, 2009: 24).⁷⁸ In effect, TRIPS is dependent on members following the requirements out of a sense of moral decency. The unenforceability of the provisions is a flaw of the TRIPS Agreement, but the requirements act as a catalyst for members to create individual enforceable regulations that are upheld by sanctions.⁷⁹

A further method of IPR improvement within the sustainable development sphere regards geographical indicators (GIs). The World Intellectual Property Organization (WIPO) identifies geographical indicators as 'a sign used on products that have a specific geographical origin and possess qualities or a reputation that are due to that origin.' The function of a geographical indicator is to allow those who own the right to make use of the indication to stop its third party use on a product which does not meet the recognized standards of manufacturing, which are generally (but not always) geographically exclusive. For example, the makers of Darjeeling tea, are the owners of the right to the indicator 'Darjeeling'. By means of this they are able to stop the word being used for tea grown outside the Darjeeling area or not manufactured to the standards of the Darjeeling tea cultivators or manufacturers.

77 Attas, D. (2008). "Lockean Justifications of Intellectual Property." In Axel Gosseries, Alain Marciano, and Alain Strowel (eds.), *Intellectual Property and Theories of Justice*. Basingstoke and New York, NY: Palgrave Macmillan.

78 Abbott, F. (2009). *Innovation and Technology Transfer to Address Climate Change: Lessons from the Global Debate on Intellectual Property and Public Health*. ICTSD Programme on Intellectual Property Rights and Sustainable Development, ICTSD, 24.

79 Ibid., 29.

In this way, when there is a localized entrepreneurship which involves process and production innovations, which fit with local contexts, intellectual property activity will vary with some enterprises obtaining patents and trademarks. This is relevant for social enterprises which serve underserved populations and may also train marginalized individuals. Examples of this include Eco Femme in India which produces reusable sanitary pads, iKure in India which offers primary health care through a hub-and-spoke model and SOIL in Haiti which is a sanitation service.

Geographical indicators are overseen by a number of international agreements and accords offering safeguarding to the right. Agreements such as the Madrid Agreement and Protocol, the TRIPS Agreement, the Lisbon Agreement, the Paris Convention, and the Geneva Act on the Lisbon Agreement each have wide-ranging specifications regarding geographical indicators. Geographical innovations differ from other IPRs in that they are intrinsically communal. Patents and copyrights are commonly held individually. Companies or manufacturers hold trademarks. However, geographical indicators are not created by a particular individual. It defines and differentiates the geographic source of a product (Roffe, 2017: 303).⁸⁰

In this way, it belongs to and may be applied by all those in that particular geographical area. This benefits sustainable development in the social sphere. As stated previously, the social sustainable development sphere is effectively related to the human/social feature of the notion, and geographic indicators enhance social sustainability as they support the community (and financial) enhancement of needy rural areas. Geographical indication rights largely lie with regional manufacturers, and any financial value generated by the indicator is held by those manufacturers. This means a greater level of income for regional manufacturers and improved employment opportunities. The sustainable development domains are intertwined, and an enhancement in social sustainability will mean a boost in one or both spheres.⁸¹

Vietnam is a relevant example of this, where the application of geographic indicators of the Cao Phong Orange, the Tra Bong Cinnamon, and the Tân Cương Tea, has been recognized for increasing regional work opportunities for a range of differently skilled workers in these areas. Subsequently, this has led to a decrease in migration to urban areas, reducing ecological pollution in those areas. Thus, it is possible to see the development as social sustainability resulting in economic sustainability resulting in environmental sustainability. Finally, the protection offered by intellectual property rights aims to guarantee and advance innovation, in addition to offering incentives for invention by awarding interim protection to creators. Additionally, since IPRs aim to accelerate the transfer of technology for development purposes via the need for disclosure on recently developed intellectual products, then there is evident

80 Roffe, P. (2017). "Preferential Trade Agreements and the Protection of Genetic Resources and Associated Traditional Knowledge." In Daniel Robinson, Ahmed Abdel Latif and Pedro Roffe (eds.), *Protecting Traditional Knowledge: The WIPO Intergovernmental Committee on Intellectual Property and Genetic Resources, Traditional Knowledge and Folklore*. Abingdon, Oxon and New York, NY: Routledge.

81 Ibid., 16.

possibility of an effective promotion of sustainable development.⁸²

Legally, Free Trade Agreements (FTAs) have increased the complexity of IP within the environmental and sustainable development context, by creating provisions in excess of those international requirements, especially those laid out in the TRIPS Agreement, covering topics like education, health, and the distribution of information. As a result, newly created specifications regarding the protection of patents, information monopoly and the application of copyright have been criticized for decreasing the flexibility stated in the international agreements. FTAs formally recognize the idea of sustainable development, but not in a manner closely connected to the chapter that outlines IP. For example, regarding The Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP). The CPTPP comments on sustainable development, in the Preamble and the development section. The Agreement was ratified in 2017 by the following signatories: Australia, Brunei, Canada Chile, Japan, Malaysia, Mexico, New Zealand, Peru, Singapore, and Vietnam. Several FTAs, introduce sections applicable to the intersection of IP and sustainable development. For example, references to biological diversity and requirements of information disclosure.⁸³

To draw the analysis to a close, in the same way that IPR can be used to further the sustainable development, they may also hinder sustainable development. Intellectual property rights function by limiting access to protected products, increasing the probability of a technological and invention monopoly. The unique individual character of the majority of IPRs demonstrates that it is the personality and nature of the holder of the rights who controls the distribution of any sustainable invention. Should the holder determine to withhold the information, there are few methods by which they can be obliged to. While these concerns are genuine, they do not diminish the idea that IPRs can create a viable route to sustainable development. Policymakers need to consider the issues and make amendments.

82 Hoang et al., *op.cit.*

83 For a comprehensive discussion of changes that will be made in IP protection of traditional knowledge, see Hennie Klopper (2016), *Law of Intellectual Property in South Africa*, 2nd Edn. New York: LexisNexis.

8.0. Conclusion

The relationship between innovation and intellectual property has been the subject of numerous discussions. Intellectual Property Rights (IPR) area a key contributor to the promotion of sustainable development. The significance of IPR in accelerating development objectives is evident and numerous policies and projects advancing invention and safeguarding intellectual property are in place. Despite the advances, issues remain to be resolved in IPR and sustainable development. IPRs, in some cases, are also seen as a barrier to both the ingenuity and creativity of businesses in developing countries, such as those within sub-Saharan Africa for instance, that aim to learn and possibly catch up to established economies in terms of innovation. These issues comprise enhancing the efficiency of IP legislation and regulations, consolidating implementation mechanisms, and improving better public understanding and knowledge of IPR. It is also critical to reach a balance between safeguarding intellectual property and enhancing the accessibility of necessary products and services, especially those in the realm of medicine and environmental sustainability.

IPR therefore, should incorporate features such as compulsory licensing, exemptions for research exceptions, and the protection of both traditional knowledge systems and contemporary forms. This flexibility plays a crucial role in addressing the unique challenges of sustainable development, especially in developing nations. This allows for the acquisition of a broader knowledge base, the development of original inventions, and the preservation of diversity.

This paper considers both ideas, then evaluates ways in which intellectual property rights can be leveraged to encourage sustainable development and to create a better world.⁸⁴ This research intends to offer an outline of intellectual property within a sustainability context. It discusses the evolving intersection of IP and sustainable development and current issues faced. The wide-ranging scope of sustainable development, incorporating economic, social, and environmental concerns means it is difficult to address each one in this paper.

Within the extensive context of sustainable development, this study also considers the effects of IP on sustainability issues. Taking this into account, the paper starts by presenting the idea of sustainable development, it studies the management of IP in key sustainable development areas and in international IP settings.

Some of the examples mentioned in this study show that although strong IPR protection can stimulate both innovation and technology transfer and adaptability in IPR policies are still needed in other areas. For example: to address public health emergencies, to safeguard traditional knowledge and to guarantee access to sustainable technologies. The different outcomes in such cases illustrates just how specific IPR context needs to be if it is to truly help us reach the goals

84 May, C. and Sell, S.K. (2005). *Intellectual Property Rights*. Boulder, CO: Lynne Rienner Publishers. 73.

of the 2030 Agenda for Sustainable Development.

The study also highlights several issues aiming to understand this intersection more clearly and to unify the different spheres of sustainable development and IP. The paper focuses on IP problems and potential opportunities within the sustainable development model and considers how suitable policies might encourage positive recommendations or minimise IPR issues that may occur during development. The paper concludes with proposals for areas of future legal research.

Consequently, developing countries exhibit significant heterogeneity, a reality that is often overlooked. Their scientific and technical capacities, as well as their social and economic structures, exhibit significant variation, alongside disparities in income and wealth. The determinants of poverty and the corresponding policies to address it will differ among countries. This principle is also applicable to policies regarding intellectual property rights. Policies needed in nations with advanced technological capabilities, such as India or China, may differ significantly from those in countries with weaker capabilities, like many in sub-Saharan Africa. The effects of IP policies on impoverished individuals will differ based on socio-economic conditions. Strategies effective in India may not yield the same results in Ghana or Venezuela.

Overall, the incorporation of IPR into sustainable development strategies and legislation is vital for encouraging invention, building economic openings, and reaching national sustainable development objectives. As nations continue to progress and encounter new obstacles, the successful administration of IPR will be vital to guarantee a wealthy and sustainable future for everyone.

For a debate like this to be successful, a wide range of views and stakeholders needs to consider the part played by IPRs in sustainable development, both in respect of encouraging invention, allowing access to the results of this invention, and managing access issues. A broad discussion such as this could help further a more all-encompassing attitude to IP within sustainable development. Scholarship of the legal aspects can contribute significantly by aiming to clarify and solve some of the remaining unsolved legal matters in this context. Meanwhile, the development of original attitudes and ideas to IP and sustainable development, are, probably to originate with creative organisations and social businesspeople who are free from the more traditional and fixed viewpoints on IP.

9.0. Recommendations

- Urging developing countries to create patent systems tailored to their specific circumstances and objectives must be a priority, which will differ based on their stage of development.
- Instead of weakening patentability standards to include the incremental innovations common in many developing countries, policymakers and legal specialists should explore the implementation of utility model protection to encourage and reward these innovations.
- Establish mechanisms to inhibit the issuance or enforcement of patents related to biological materials or traditional knowledge acquired in violation of access laws, likewise exclude plants and animals from patentability.
- Additional research is necessary to evaluate the specific role of utility model protection and similar systems in developing countries.
- Diagnostic, therapeutic, and surgical methods for the treatment of humans and animals should be entirely excluded from patentability
- Ensure international exhaustion of patent rights
- Implement a robust compulsory licensing system along with sufficient government use provisions.
- Offer extensive exceptions to patent rights, including a sufficient research exemption and a clear ‘Bolar exception.’
- For developing countries, implement rigorous criteria for novelty, inventive step, and industrial applicability or utility, potentially exceeding the standards presently utilised in developed nations.
- Implement stringent patentability and disclosure standards to restrict excessively broad claims in patent applications.
- Offer a cost-effective opposition or re-examination process
- Consider offering alternative protection mechanisms to promote local innovation that does not meet patentability criteria.

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