# The Indian Journal for Research in Law and Management

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Editor-in-Chief – Dr. Muktai Deb Chavan; Publisher – Alden Vas; ISSN: 2583-9896




## A COMPREHENSIVE ANALYSIS OF INTELLECTUAL PROPERTY RIGHTS IN THE ERA OF CLIMATE CHANGE


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### Introduction

One of the most important global issues of the twenty-first century is the phenomena of climate change, which has an impact on economies, cultures, and ecosystems worldwide. Extreme weather, biodiversity loss, rising global temperatures, and an increase in the frequency of environmental disasters have all called for immediate and concerted international response. In this regard, technical innovation is essential to reducing the negative consequences of climate change and promoting the shift to sustainable development. Reducing greenhouse gas emissions and fostering environmental resilience are thought to depend on the creation and application of environmentally sound technology, sometimes known as "green technologies." However, the framework of intellectual property rights (IPR) has a major impact on the governance of such technology, raising important legal and policy issues.By giving creators temporary exclusive rights over their inventions, intellectual property rights—especially patents—are intended to encourage innovation. This exclusivity promotes more investment in innovation and enables innovators to recoup their R&D expenses. However, IPR's monopolistic character may limit access to vital technology, particularly in emerging and least-developed nations. In the context of climate change, when the need for quick and extensive adoption of green technologies is critical, the conflict between fostering innovation and guaranteeing fair access to technology becomes especially acute. Thus, the relationship between IPR and climate change has emerged as a central topic in international legal discourse. The World Trade Organization oversees the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS), which sets basic requirements for the

defence and upholding of intellectual property rights among its member nations. TRIPS has been criticised for favouring the interests of rich countries and multinational firms, frequently at the expense of poorer nations, despite its stated goals of harmonising IPR regimes and fostering innovation. The transmission of climate-friendly technologies to nations that lack the financial and technological resources to independently develop such advances may be hampered by the strict patent protections required under TRIPS.Due to high costs, licensing restrictions, and a lack of technical experience, developing nations—which are disproportionately impacted by climate change—often encounter substantial obstacles when attempting to obtain green technologies. Because people who contribute the least to greenhouse gas emissions are frequently the most vulnerable to its effects, this raises questions about global equity and justice. The idea of "common but differentiated responsibilities," which is acknowledged in international environmental law, emphasises how rich nations must lead the charge in combating climate change and provide financial and technological support to developing countries. Global inequality may worsen, nevertheless, if the current IPR framework is unable to sufficiently sustain such assistance. In response to these difficulties, a number of strategies have been put out to achieve a compromise between guaranteeing access to climate-friendly technologies and safeguarding intellectual property rights. One such method is compulsory licensing, which permits governments to permit the use of patented innovations under specific circumstances without the patent holder's approval. The pharmaceutical industry has made extensive use of compulsory licensing to increase access to necessary medications; this practice may be expanded to include green technologies. In a similar vein, open innovation models and patent pools have been proposed as ways to encourage cooperative research and ease the exchange of technological expertise. These strategies seek to lower transaction costs, steer clear of patent thickets, and improve the availability of environmentally friendly solutions. The significance of international agreements and organisations in fostering technology transfer is another significant facet of the IPR-climate change relationship. The Paris Agreement and the United Nations Framework Convention on Climate Change (UNFCCC) both stress the significance of technology development and transfer in accomplishing climate goals. For example, Article 10 of the Paris Agreement emphasises the necessity of accelerating, promoting, and enabling innovation for successful climate action. Despite these pledges, there is still little actual technology transfer, which is sometimes hampered by intellectual property restrictions and insufficient funding sources. Addressing the issues raised by the

confluence of IPR and climate change also depends heavily on country legal systems. A balanced approach to intellectual property protection has been taken by nations like India, which have incorporated legal framework flexibilities to accommodate public interest concerns. The Indian judiciary has often stressed the necessity of preventing the misuse of patent rights and the significance of having access to necessary technologies. The Supreme Court of India emphasized the need of preventing evergreening of patents and making sure that patent protection does not come at the expense of public welfare in Novartis AG v. Union of India. The case's fundamental ideas apply to the field of green technology even though it mostly dealt with pharmaceutical patents. Additionally, moral and ethical issues are raised in the discussion of IPR and climate change. In light of a worldwide environmental catastrophe that jeopardizes human survival, the question of whether it is reasonable to impose stringent intellectual property protections emerges. Some academics contend that IPR regulations should be loosened in order to promote the widespread adoption of green technologies since climate change should be viewed as a global public good. Some argue that reducing IPR rights could hinder innovation and deter funding for R&D. The difficulty of balancing financial incentives with environmental requirements is highlighted by this ongoing discussion. Furthermore, the development and application of green technology are heavily influenced by the business sector. In order to preserve their interests, multinational firms and academic institutions make significant investments in innovation through intellectual property protection. Nonetheless, the necessity of sustainable business practices and corporate social responsibility is becoming more widely acknowledged. A growing number of businesses are embracing voluntary licensing agreements and taking part in cooperative efforts to combat climate change.

**Review Of Literature**

In Indian legal and policy literature, the connection between intellectual property rights (IPR) and climate change has received more attention. Scholars and organisations have investigated whether the current intellectual property framework facilitates or impedes access to ecologically sound technologies in light of the growing significance of environmental protection and sustainable development. The literature has a mixed stance; some stress the value of IPR in fostering innovation, while others draw attention to how it restricts access and technology transfer. The significance of intellectual property rights in fostering innovation and technological advancement

has long been acknowledged by Indian legal academics. It is sometimes said that patent protection encourages businesses and innovators to spend money on R&D, particularly green technology. Addressing climate change issues is thought to need innovation in waste management, pollution control, and renewable energy technology. But academics also note that not everyone benefits equally from such innovation, especially in emerging nations like India. Access to green technologies is a major issue that has been brought up in the literature. Strong patent protection, according to many academics, can result in expensive and scarce environmentally friendly innovations. For developing nations, which might not have the financial means to purchase such technologies, this raises obstacles. Because of this, the nations most at risk from climate change frequently have trouble obtaining the resources needed to lessen its effects. In the Indian context, where developmental priorities and economic limitations are important factors, this issue has been extensively studied. The Law Commission of India has highlighted the necessity of adaptable legal frameworks that are sensitive to issues of public interest in a number of its publications. These publications emphasise the significance of striking a balance between social welfare and individual rights, even though they do not directly address climate change. Overall, the literature study demonstrates that although intellectual property rights are crucial for fostering innovation, they can also make it difficult to guarantee access to environmentally friendly technologies. A balanced strategy that protects intellectual property while allowing for enough flexibility to address public interest and environmental issues is generally supported by Indian scholarship. Nevertheless, there is still a gap in the practical application of these ideas.The literature now in publication also suggests that further investigation is required to create workable solutions that can close the gap between access and creativity. It is necessary to investigate how legal frameworks might be changed to better support the objectives of sustainable development and climate change mitigation. This entails looking at how institutional processes, international agreements, and national legislation support the transfer and spread of environmentally friendly technologies.

**Objective Of The Study**

With an emphasis on striking a balance between innovation and the availability of environmentally friendly technology, the current study attempts to investigate the connection between intellectual property rights and climate change. The following are the study's particular goals:

- To examine how intellectual property laws encourage the development of environmentally friendly technologies.

- To investigate if access to and adoption of green technology are hampered by the current intellectual property laws.
- To assess how well international legal frameworks support technology transfer in relation to climate change.
- To examine the obstacles that developing nations, especially India, encounter when trying to get patented environmental technologies.
- To recommend legislative and regulatory changes that strike a balance between environmental sustainability and intellectual property protection.

**Research questions**

The following research questions are the focus of this study:

- What part do intellectual property rights play in encouraging the development of environmentally friendly technologies?
- Do laws pertaining to intellectual property prevent people from accessing and using green technologies?
- To what extent do international legal frameworks facilitate the transfer of technology to mitigate climate change?
- What obstacles must develop nations, especially India, overcome in order to obtain patented environmental technologies?

**Analysis And Discussion**

**Role of Intellectual Property Rights in Promoting Climate-Friendly Technologies**

In recent years, the connection between intellectual property rights and climate change has become a crucial topic in legal and policy discourse. By giving inventors temporary exclusive rights, intellectual property rights—especially patents—are intended to encourage innovation. When it comes to climate change, these rights are crucial in promoting the creation of eco-friendly technology including sustainable industrial processes, energy-efficient machinery, and renewable

energy systems. The idea of encouraging innovation is at the heart of the intellectual property system. The approach guarantees that inventors can recoup their research and development expenses by granting them exclusive rights over their creations. This is particularly crucial in the area of climate technology, where innovation frequently necessitates large sums of money, technical know-how, and sustained dedication. Private organizations, businesses, and academic institutions are encouraged to invest in the advancement of green technologies by the guarantee of legal protection. Technology growth is greatly aided by patents, which are a key type of intellectual property protection. They help spread knowledge in addition to offering financial incentives. The details of the innovation must be disclosed by the inventor upon patent approval. This disclosure facilitates additional study and innovation and broadens the body of knowledge available to the public. Such information exchange is crucial for hastening the creation of sustainable solutions in the context of climate change. Additionally, the development of an organised innovation ecosystem is facilitated by intellectual property rights. They encourage innovators to compete, which results in the creation of more economical and effective technology. Intellectual property protection has been essential to advancing technology in fields including solar energy, wind power, and electric vehicles. To keep a competitive edge, businesses are urged to constantly enhance their goods and procedures. The part intellectual property rights play in promoting the commercialisation of technologies is another crucial factor. Innovation by itself is insufficient to combat climate change; technologies must also be commercialised and widely embraced. Innovators can increase their reach by licensing their inventions to other organisations thanks to intellectual property protection. Technology may be moved across countries and industries thanks to licensing agreements, which is crucial in the worldwide battle against climate change.

Furthermore, intellectual property rights facilitate cooperation among various stakeholders. To create new technology, universities, research centers, and commercial businesses frequently collaborate. By precisely defining ownership and usage rights, intellectual property laws offer a legal foundation for these kinds of partnerships. This lowers uncertainty and fosters collaborations that can spur innovation in domains linked to climate change. Government initiatives to support green innovation also clearly highlight the importance of intellectual property rights. For ecologically friendly innovations, numerous governments offer incentives like tax breaks, subsidies, and expedited patent review.

**IPR as a Barrier to Access and Technology Transfer**

Although intellectual property rights are essential for fostering innovation, they have also come under fire for obstructing the availability and adoption of environmentally friendly solutions. The debate over intellectual property protection's role in combating climate change is centred on its dual nature. Patents encourage innovation, but they can also limit access to necessary technologies, especially for underdeveloped nations. The exclusivity provided to patent holders is one of the main issues surrounding intellectual property rights. A patent gives the creator the legal right to stop others from producing, utilising, importing, or selling the innovation without permission. Although the goal of this exclusivity is to encourage innovation, it may also restrict the accessibility of technology, particularly if they are too expensive for underdeveloped nations. This is a serious problem in the context of climate change because many environmentally friendly innovations are copyrighted by organisations with headquarters in industrialised nations. The problem of access is directly related to the issue of affordability. Energy-efficient equipment and renewable energy systems are examples of green technology that frequently have high upfront prices. The costs may go up much more when these innovations are covered by patents because of royalties and licensing fees. Such expenses can be a significant deterrent to adoption in developing nations, which already struggle financially. This underscores the need for a more inclusive intellectual property law and raises questions about the fair sharing of technical gains. The limitation on technological transfer is another significant factor. The practice of sharing knowledge, skills, and technologies between nations and institutions is referred to as technology transfer. It is essential to international efforts to fight climate change because it gives developing nations access to cutting-edge technologies that they might not be able to produce on their own. Strict intellectual property laws, however, can impede this process by making patent holders less inclined to share their technologies. Technology transfer frequently takes the form of licensing agreements. Although licensing can make access easier, it frequently comes with terms and conditions that might not be advantageous to the recipient. Owners of patents may charge exorbitant licensing costs, limit access for a certain amount of time, or restrict the scope of use. Such circumstances may hinder the widespread adoption of green technologies and lessen the efficacy of technology transfer. Additionally, the issue is made worse by the concentration of patent ownership within a few large businesses. These companies can affect market dynamics to their benefit and frequently have substantial control over important technologies. Monopolistic

conditions, in which a small number of companies control the market and limit competition, may result from this concentration. Smaller businesses and developing nations may therefore have trouble accessing or creating alternative technology. A recurrent element in the IPR-climate change argument is the disparity between wealthy and developing nations. Developed nations are better positioned to innovate and protect intellectual property rights because of their sophisticated research infrastructure and financial resources. On the other hand, emerging nations frequently lack the resources to carry out advanced research and development. This leads to a reliance on foreign technologies, which are frequently patent-protected. The ensuing power disparity may make it more difficult for underdeveloped nations to successfully handle their climate-related issues. The strictness of the international intellectual property framework is another important problem. Member nations must abide by the minimal criteria specified by international agreements for the defence and enforcement of intellectual property rights. These norms may not always be appropriate for all nations, even though they seek to establish consistency and predictability. More adaptability may be necessary for developing countries to meet their unique needs, especially in light of climate change. Even while the intellectual property system has several flexibilities, their actual use is frequently restricted. For instance, under some circumstances, governments can permit the use of patented inventions without the patent holder's approval through procedures like compulsory licensing. However, legal, political, and economic constraints frequently limit the deployment of such remedies. Governments may be hesitant to use these clauses out of concern about diplomatic pressure or commercial retribution.

**Effectiveness of International Legal Frameworks in Facilitating Technology Transfer**

One of the main concerns in the global response to climate change is how well international legal frameworks facilitate technological transfer. Because climate change is a global issue, governments must work together to address it, especially when it comes to exchanging environmentally friendly technologies. In order for developing nations to embrace sustainable practices and lessen their environmental effect, technology transfer is essential. However, the real transfer of technology is still uneven and limited despite the existence of numerous international institutions. The process of sharing ideas, expertise, and knowledge across national boundaries is known as technology transfer. It entails the spread of technology pertaining to sustainable development, energy efficiency, and renewable energy in the context of climate change.

Developing nations frequently lack the funding and technical know-how needed to create these technologies on their own. In order to prevent these nations from falling behind in global climate efforts, international cooperation becomes crucial. One of the most important international agreements in this regard is the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS). There are clauses in TRIPS that acknowledge the significance of technology transfer. It promotes wealthier nations to offer businesses incentives to transfer technology to the least developed nations. Nevertheless, these clauses lack strong enforcement measures and are essentially non-binding. Their practical impact has been limited as a result. The effectiveness of these laws is diminished because developed nations are not legally required to guarantee technology transfer. The United Nations Framework Convention on Climate Change (UNFCCC) is another important framework. Technology transfer is emphasised by the UNFCCC as a crucial component of climate action. It recognises that rich nations have an obligation to provide financial and technological support to developing countries. The Convention promotes collaboration and the exchange of environmentally friendly technologies. The significance of technology transfer has been further emphasised by later developments under the climate policy. Numerous systems have been put in place to encourage collaboration, offer technical assistance, and make knowledge sharing easier. These programs seek to overcome some of the shortcomings of previous frameworks and establish a more organised method of technology transfer.

**Challenges Faced by Developing Countries in Accessing Climate-Friendly Technologies and the Way Forward (With Special Reference to India)**

One of the most important aspects of international efforts to fight climate change is access to climate-friendly technologies. Such access is crucial for emerging nations like India to meet rising energy demands while achieving sustainable development. However, despite widespread acknowledgement of the value of technology transfer, a number of obstacles still stand in the way of efficient access to and use of environmentally friendly technologies. Finding workable answers and legislative initiatives that can handle these issues in a fair and long-lasting way is also becoming more and more important. The high expense of climate-friendly technologies is one of the biggest obstacles. Advanced technologies that are protected by intellectual property rights, like carbon capture devices, energy-efficient infrastructure, and renewable energy systems, are frequently created in wealthy nations. The significant expenses of research and development

associated with these technologies are reflected in their market prices. This provides a financial hurdle for developing nations like India, making widespread adoption of these technologies challenging. India has made strides in renewable energy, especially solar electricity, but overall costs are still rising due to the country's reliance on imported technology. Access to technology is made more difficult by the problem of intellectual property rights. The minimum requirements for patent protection set forth by the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) may restrict developing nations' access to patented innovations. Protection of intellectual property can result in monopolistic control over vital technologies, even if it is required to encourage innovation. This limits accessibility for nations with little financial resources by limiting competition and maintaining high pricing. The difficulty in the Indian context is striking a balance between the need to safeguard innovation and the need to guarantee that climate-related technology are affordable. Another significant obstacle is financial limitations. Technology transfer includes expenses for adaptation, installation, maintenance, and capacity building in addition to the simple purchase of equipment. Budgetary constraints and conflicting development agendas frequently prevent developing nations from investing in costly technologies. Financial help is provided by international mechanisms, but the actual flow of funding has been insufficient. Even though India actively participates in international climate initiatives, there is still a discrepancy between its financial needs and the assistance it gets from other countries. The efficiency of technology transfer is also impacted by institutional and infrastructure constraints. It is not enough for nations to just have access to technology; they also need to be able to successfully absorb and use it.

**Suggestions And Conclusion**

One of the trickiest problems in modern global governance is the relationship between intellectual property rights and climate change. Technology now plays a crucial part in accomplishing sustainable development goals as the world becomes more aware of how urgent it is to solve climate change. Reducing greenhouse gas emissions and minimising environmental harm requires climate-friendly technology including renewable energy systems, energy-efficient infrastructure, and ecologically sustainable industrial operations. Access to these technologies is still uneven, though, especially for developing nations like India. This study has shown that although intellectual property rights are crucial for promoting innovation, they can also serve as obstacles

to the widespread adoption of vital technology. The goal of the international legal framework, especially under the TRIPS Agreement, is to strike a balance between the interests of inventors and users; but, in reality, this balance frequently favours more robust protection over greater accessibility. As a result, obtaining and applying climate-friendly technologies is extremely difficult for developing nations. The data also shows that international organisations like the UNFCCC have acknowledged the value of technology transfer and have made an effort to establish support and collaboration channels. However, these procedures are frequently constrained by their lack of enforcement, non-binding nature, and inadequate funding. As a result, there is a disconnect between policy promises and actual execution, which compromises the efficacy of international climate initiatives.