INTEGRATING TRADITIONAL KNOWLEDGE IN THE DEVELOPMENT OF ECO-FRIENDLY INNOVATIONS AND PATENTS

Anukriti Chauhan, LL.M. (Corporate Law), ICFAI University, Dehradun

ABSTRACT

Integrating traditional knowledge into the development of eco-friendly innovations and patents presents a promising pathway towards sustainable development. Traditional knowledge, often embedded in indigenous practices and ecological wisdom, offers valuable insights into natural resource management, biodiversity conservation, and sustainable practices. By merging this knowledge with modern technological advancements, innovative solutions can be created that address pressing environmental challenges such as climate change, resource depletion, and pollution. This integration not only fosters eco-friendly innovation but also respects cultural heritage and community ownership of knowledge systems.

However, the integration of traditional knowledge into modern innovation faces several challenges. Intellectual property rights conflicts and concerns of biopiracy are significant hurdles, as traditional knowledge is often not recognized under conventional patent systems. Legal frameworks like Section 3(p) of the Indian Patents Act aim to protect traditional knowledge from monopolization while encouraging its use in novel inventions. Equitable benefit-sharing mechanisms are crucial to ensure that communities contributing traditional knowledge benefit from its commercialization.

Collaborative efforts between policymakers, researchers, and local communities are essential to navigate these challenges. Such collaborations can lead to the development of sustainable technologies that are both environmentally friendly and socially responsible. Moreover, integrating traditional knowledge into innovation can enhance the cultural relevance and acceptability of new technologies, thereby improving their adoption rates and effectiveness.

The potential of traditional knowledge in driving eco-friendly innovation is vast. For instance, traditional agricultural practices can inform sustainable farming methods, while traditional medicine can inspire novel treatments with reduced environmental impact. By embracing this integration, we can

not only advance global sustainability goals but also preserve cultural diversity and promote equitable development. Ultimately, the fusion of traditional wisdom with modern science holds the key to creating a more sustainable future for all. This approach requires a balanced and inclusive strategy that respects the past while shaping the future.

Keywords: Traditional Knowledge, Biopiracy, innovations, Patent, Legal frameworks.

1. Introduction

As new innovations take place on a daily basis, it leads to more usage of natural resources and exploitation of these resources. The technologies foster the economical development of the country but also adversely affect the soil, water, and air and even affect the animals and human health. Life is dependent upon the greenery, which has to be protected. In the early period of life, humans used to live with the environment, but as of now, development is necessary for any country, which can only be possible by doing new innovations. The eco-friendly innovations are those innovations helping with the environmental and climate change issues and helping to navigate waste management. These innovations can be fostered with the help of traditional knowledge of our ancestors, who used to live life under the ambit of sustainability. Traditional wisdom plays a vital role in the conservation of natural resources. Traditional knowledge is important for fulfilling the future goals related to the long-term environmental goals. Indigenous communities preserve this knowledge. The Biodiversity Act, 2002, protects the rights of the indigenous communities. It also focuses on fair and equitable sharing (FEBS) for these communities.

According to WIPO (World Intellectual Property Organization), the term "traditional knowledge" refers to traditional-based literary, artistic, or scientific works; performances; inventions; scientific discoveries; designs; marks; names and symbols; undisclosed information; and all other traditional-based innovations and creations resulting from intellectual activity in the industrial, scientific, literary, or artistic fields.[1]

Traditional knowledge can be based upon culture, art, music, science, practices, and medical knowledge. biodiversity, etc.

[1] Subbaram, "*Inventions not Patentable"* in Subbaram*: Patent Law Practice & Procedures,* LexisNexis India, 2nd ed., 2007)

Usually, the information that is known to the general public already can't go for a patent, as it will be contrary to the patent's features like newness, novelty, non-obviousness, and industrial ability, which are not fulfilled here. Because traditional knowledge has been kept in the society for ages and is not new. In the case of *Dhanpat Seth v. Nil Kamal Plastic Crates Ltd.*[2], the court observed the design of the Kilta, the traditional product of hill areas like Himachal Pradesh that is made up of bamboo. The court held that the plaintiffs and defendant copied the design of Kilta and made their design with polypropylene copolymer (PP) and high-density polyethylene (HDP), which is plastic in common language. The court further held that the device developed by the plaintiffs is copy of the traditional knowledge. So, there is no newness in the product, and therefore, it cannot be considered as an invention. Traditional knowledge can only patent with the consent of the indigenous community.

2. Traditional Knowledge

Traditional Knowledge plays the vital role in bio-diversity conservation. It is usually orally transmitted through generation to generation. It is not documented to generation to generation but now it can be documented like in India there is Traditional knowledge digital library (TKDL) which ensures that the indigenous communities get the benefit of their knowledge and it also helps to prevent biopiracy.

Biopiracy is use of traditional knowledge for commercial purpose without giving authorization or compensation to the knowledge holders and it also put adverse effect on the natural resources/environment. The drug *"jeevani*" is developed on the basis of the traditional knowledge of the Kani Tribe which is made up of *Arogyaoacha* seeds that helps to energize the body.[3]

In India, there is wisdom of traditional knowledge but there are many cases where foreign countries exploit this wisdom and got patent. Indian products such as the neem tree, tamarind, turmeric, and Darjeeling tea have all been patented by foreign firms for different lucrative purposes.[4] Some of the example of indigenous communities are Gond from

[2] (2008)36PTC123(HP)(DB)
[3] Dr. Niti Pathak," Traditional Knowledge and its Role in Biodiversity Conservation", vol.9 *Journal of Agroecology and Natural Resource Management* 41(2022)
[4] Rose Janna, available at: - https://theconversation.com/biopiracy-when-indigenous-knowledge-is-patented-for-profit-55589?utm_source=clipboard&utm_medium=bylinecopy_url_button (Last visited on April,11 2025)

Madhya Pradesh, Chhattisgarh and Maharashtra. Bodo from assam, Mizo from Mizoram, Bhills from Rajasthan, etc.

Bio-diversity Conserved by the indigenous communities by their traditional wisdom. This wisdom can be integrated with the making of the eco-friendly innovations to prevent natural resources and economical development at the same time.

Traditional knowledge is the base of the Indian Medical System through Yoga and Ayurveda which is given by our ancestors. The knowledge about the plants that has been used for reducing many diseases since ages transferred from generation to generation like *Murraya koenigii* (Curry Leaves) helps to prevent diabetes and contains anti-cancer properties, *Ashwagandha, an Indian Ginseng* helps to reduce the stress and anxiety and has been using in cancer medicines.

3. Eco-Friendly Innovations and Green Patents

Green innovation is a type of innovation that causes minimal damage to the environment by using natural resources to introduce new ideas and technologies into society without negatively affecting nature. It is a practice that enhances the environment by reducing energy consumption, controlling pollution, ensuring resource sustainability, and promoting green product design. Additionally, green innovation not only benefits the environment but also has a positive impact on individual health.

Example of green Innovation

1. **Green Vehicles** – Transportation is one of the major causes of environmental pollution. Nowadays, almost every household owns at least one vehicle, and many of them still run on fossil fuels, which release CO_2 into the atmosphere and are harmful to the environment. To control such issues, it is important to shift towards green vehicles.

   Example: Tesla

   Tesla has been working on electric vehicles, and its Model 3 and Model Y cars are the best-selling models worldwide.

2. **Solar Glass** - If we start using solar glass, it can serve as both an energy source and a window.

   Example: Onyx Solar

   Onyx Solar is a Spain-based company that uses solar glass technology in commercial buildings, airports, and corporate headquarters. Many major companies like Apple and Coca-Cola are also adopting Onyx Solar's solutions.

3. **Biodegradable plastic**—we all know that plastic is not good for the human body as well as the environment.

   Example—Vegan bottle

   A French company named Lys packaging has developed the Vegan Bottle, which is fully biodegradable and compostable. The bottle is made from sugarcane, and both the cap and the body are plant-based.

4. **Synthetic palm oil**

   Palm oil is widely used in our beauty products and food items, which has been causing significant health impacts. Now, the biotech industry has come up with a solution — a natural alternative to palm oil that can be used in shampoos, soaps, detergents, lipsticks, and food products. Today, many new startups have started using this natural palm oil instead of synthetic palm oil.

   Examples - C16 Biosciences is a US-based company that has developed a lab-grown alternative to palm oil, eliminating the need for deforestation.

Barriers to Innovation in Developing Countries

1. **Limited Financial Resources**

   Low government and private sector investment in R&D. Accessing innovation finance or venture capital might be challenging. expensive imports of materials or technology required for innovation.

2. **Inadequate Infrastructure**

   Due to the lack of well-established infrastructure, it becomes difficult to carry out innovation.

3. **Lack of skills**

   Shortage of skilled labour and research, it becomes a barrier to green innovation.

4. **Market Barriers**

   small markets and restricted access to international markets. Cost is frequently given precedence by the consumer base above innovation or quality. Large firms' dominance and lack of competition are strangling smaller entrepreneurs.

5. **Cultural and Social Factors**

   Absence of an innovation ecosystem or entrepreneurial culture. disparity between genders in terms of educational and career prospects.

Role of Intellectual Property and Patents in Promoting Sustainable Technology

The main aim of green technologies is to keep the environment pollution-free, promote energy efficiency, and support ecological balance. Intellectual Property Rights (IPR), particularly patents, play a crucial role in encouraging and facilitating this process.

Intellectual Property provide safeguard user ideas, design trademark and creative works. One important type of intellectual property is a patent, which grants creators the only right to use and market their creations for a set amount of time (often 20 years).

How Patents Promote Sustainable Technology

1. **Facilitating Knowledge Sharing**

   The innovation must be fully disclosed in patent applications, which make it available to the public. This openness facilitates the development of better or complementary technologies by allowing others to learn from current innovations. Green patents can

be found using databases maintained by the World Intellectual Property Organization (WIPO), which promotes cooperation.

2. **Supporting Technology Transfer**

   Patents help transfer technology from industrialized to poor nations, particularly when they are a component of joint ventures, licensing agreements, or public-private partnerships.

3. **Incentivizing Innovation**

   Patents provide a short-term monopoly; patents promote R&D investment by providing the possibility of financial gain.

4. **The Role of Traditional Knowledge in Eco-Innovation**

Traditional knowledge refers to the knowledge that is passed down from generation to generation within a particular community, where people follow certain practices or use specific knowledge over time.

Contribution to sustainable Agriculture

1. **Conservation of Biodiversity**

   Traditional agricultural group preserve a large number of indigenous seed and crop varieties. These cultivars are frequently resistant to pests, droughts and poor soils, making them climate resilient. Food security and climate change adaption depend on preserving genetic variety.

2. **Soil Fertility Management**

   It is traditionally followed Organic fertilizers such as cow dung, compost and green manure improves soil structure and fertility.

3. **Climate – Responsive Farming**

   Planting and harvesting are guided by traditional predicting techniques that are based

on animal behaviour, winds, and moon cycles. In order to reduce the hazards associated with climate change, communities have created seasonal variation-based adaptive cropping systems.

4. **Natural Pest and Disease Control**

   Farmers use botanical pesticides, these techniques lessen the need for chemical pesticides, which are bad for human health and ecosystems.

Synergy Between Indigenous Knowledge and Modern Science

1. **Agriculture and Food Security**

   By combining indigenous farming practices with modern tools, it is possible to increase healthy productivity and sustainability.

2. **Healthcare and Medicine**

   By combining traditional remedies with modern science, it is possible to develop new drugs and integrative health systems.

5. **Compliance of Indian Patent Law with Traditional Knowledge: - Challenges and International Legal Frameworks**

Intellectual Property Rights (IPR) are the exclusive rights provided to the creator or inventors to protect their creation. These rights are granted for the creation of the human mind. Intellectual Property Rights (IPR) can be many kinds like copyright, trademark, patent, geographical indication, etc. However, these have to face many challenges like infringement, Piracy, Bio-Piracy, etc. According to Section 3 (p) An invention which in effect, is traditional knowledge or which is an aggregation or duplication of known properties of traditionally known component or components.[5] This section provides the protection to the traditional knowledge. In order to get the patent on traditional knowledge, the other that arises in Patentability is misappropriation and biopiracy.

Misappropriation means use of someone's else protected work under IP. While on the other

[5] The Patents Act, 1970

hand, Biopiracy is usage of biological resources and traditional wisdom without authorization.[6]

It affects the indigenous communities as traditional knowledge has been kept by these communities. For doing patent of such knowledge prior consent from communities has to be taken through agreement with the promise that profit sharing would be equally distributed.

Using traditional knowledge without consent leads to difficulties like validity of the source and lack of recognition as traditional knowledge transmits from generation to generation.[7] It also creates hindrance in documentation of patents.

Convention on Biological Diversity (CBD) and Nagoya Protocol

Convention on Biological Diversity (CBD) and Nagoya Protocol are the international agreement with the purpose of biodiversity conservation and fair usage of genetic resources.

Convention on Biological Diversity (CBD) was adopted in 1992 at the Earth Summit in Rio de Janeiro and came into force 29 December 1993 with the objectives of conservation of biodiversity, sustainable use of biological resources and fair and equitable sharing of profit arising from the use of these genetic resources. Nagoya Protocol stands for Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising From their Utilization, adopted on 10 October 2010 at Nagoya, Japan. It came with the aim to implement the 3rd objective of Convention on Biological Diversity (CBD) i.e., Access and Benefit Sharing (ABS). It focuses on the legal framework for access to genetic resources, Fair and Equitable Sharing of benefits from their use and ensures prior informed consent (PIC) and mutually agreed terms (MAT) between providers and users of genetic resources.[8]

These protocol supports the sustainable development and protection of the rights of indigenous community and also regulates bioprospecting.

World Intellectual Property Organization (WIPO)

WIPO's work on these issues lies at the nexus of intellectual property (IP) and biodiversity,

[6] Ibid. Pg.6
[7] Ibid.Pg.4
[8] Convention on Biological Diversity,1993 and The Nagoya Protocol,2014, art.12, available on https://www.cbd.int/access-benefit-sharing

cultural heritage, agriculture, trade, life sciences, human rights, health, climate change and sustainable development.[9] Many Indigenous Peoples, local communities and governments seek intellectual property (IP) protection for traditional knowledge (TK) as intangible assets. Such assets can range from traditional medicine and environmental knowledge to art, symbols and music. Genetic resources (GRs) as such are not patentable but inventions based on them may be patentable.[10]

Traditional Knowledge Digital Library (TKDL)

The Traditional Knowledge Digital Library (TKDL) project, initiated in India in 2001, is a collaboration between the Council of Scientific and Industrial Research (CSIR), Ministry of Science and Technology, and the Department of Ayurveda, Yoga and Naturopathy, Unani, Siddha and Homeopathy (AYUSH), Ministry of Health and Family Welfare, of India. It is being implemented at the CSIR. The inter-disciplinary team involved in the creation of the TKDL for Indian Systems of Medicine included traditional medicine experts (Ayurveda, Unani, Siddha and Yoga), patent examiners, IT experts, scientists and technical officers.[11]

6. Conclusion

Integrating traditional knowledge into the development of eco-friendly innovations and patents offers a powerful pathway toward sustainable development. Traditional knowledge, rooted in generations of close interaction with nature, often embodies practices that are inherently sustainable, resource-efficient, and culturally relevant. By respecting and incorporating these insights into modern scientific and technological efforts, we can create innovative solutions that are both environmentally sound and socially inclusive. Moreover, ensuring proper recognition and protection of traditional knowledge holders through equitable benefit-sharing mechanisms is crucial for ethical innovation. Ultimately, blending traditional wisdom with modern ingenuity not only enriches innovation but also fosters a more just and ecologically resilient future.

[9] World Intellectual Property Organization (WIPO), Available on - https://www.wipo.int/en/web/traditional-knowledge/tk/index
[10] Ibid.Pg.9
[11] World Intellectual Property Organization (WIPO), Available on- https://www.wipo.int/meetings/en/2011/wipo_tkdl_del_11/about_tkdl.html