

IPR for Food Security in Developing Countries: Opportunities and Challenges

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Abstract

The ability of a country to produce enough food to feed its population is directly related to its agricultural resources, trade relationships, and economic partnership. The present study focuses on the role of Intellectual Property Rights (IPR) in food security and how they are helpful to protect the traditional and farmer rights. However, it can also have some negative impacts on food sovereignty, such as giving companies monopoly control over the essential agricultural inputs and preventing the sharing of information and knowledge. The World Trade Organization (WTO) and the Food and Agriculture Organization (FAO) have encouraged the developing and under-developed countries to introduce IPRs into their agricultural sectors by highlighting the economic benefits. The use of intellectual property rights (IPRs) in agriculture has both positive and negative effects on food security in developing and least developed countries. The paper discusses Whether evolving and emerging the IPR will protect the farmer's rights especially in developing countries where the farmers are small-scale, IPR needs to be carefully designed to ensure that they do not disadvantage these farmers. The paper also looks at how IPRs affect private investment in developing new crop varieties.

Keywords: Intellectual property rights (IPR), food security, agriculture, developing country, farmers

INTRODUCTION

The growing global population and its needs led to the rise of food insecurity especially in developing and least developed countries. According to a WTO report, the Ukraine-Russia conflict escalated food insecurity [1]. Earth bioresources are vital for humanity, economy and social development. Agricultural biotechnology is a promising solution to this challenge, as it can help to increase crop yields, improve resistance to pests and diseases, and make crops more tolerant of abiotic stresses such as drought and salinity. Recently we can see the China government calling for the biotechnology breakthrough in seed industry to improve their food security, an urgency of worsening ties with the United States and allies -many of important food exporters- and Russia invasion in Ukraine [2]. IPRs can play a role in incentivizing investment in agricultural biotechnology research and development, and ensuring that the benefits of these technologies are shared equitably the united states was first country to grant intellectual property rights for plant varieties [3]. It is important to note there are potential risks and benefits of technologies before adopting it and this paper will go through the challenges and opportunities of a nation having the IPR policy as a food security tool.

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INTELLECTUAL PROPERTY IN FOOD SECURITY

Hunger is a grave abuse of human dignity and a fundamental human rights violation. It prevents progress, fuels conflict and instability, reduces productivity, and shortens lifespans. When the Green Revolution began, there was no discussion about the role that intellectual property (IP) would play in agricultural modernization. It was largely the development of new biotechnology based on genetic engineering that brought IP into the food

security arena. A number of issues intersect with food security, including sustainable agriculture, the impact of trade (especially the Agreement on Agriculture, the SPS Agreement, the WTO Agreement on Technical Barriers to Trade, and the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS)), and IP rights.

The debate about whether agriculture is a suitable subject for IP protection has considered the main categories of IP that are relevant to food security, such as plant variety rights (PVRs), patents, industrial designs, trademarks, geographical indications (GIs), confidential information, copyright, and database rights. The Plant Variety Protection (PVP) system has evolved over time, from the International Union for the Protection of New Varieties of Plants (UPOV) to the Paris Convention to the TRIPS Agreement. No country has yet raised concerns about food security in the context of PVP protection.

However, TRIPS Article 27.3(b) and its relationship to the Convention on Biological Diversity (CBD) are very important, as is the defense of IP rights for plants and seeds in developing countries. Before we can analyze international frameworks, we need to understand some more advanced concepts, including traditional knowledge (TK).

Traditional Knowledge

Traditional knowledge is knowledge, skills, and practices that have been developed and passed down from generation to generation within a community. It is often an important part of a community's cultural or spiritual identity.

- Traditional knowledge can be found in many different areas, including agriculture, medicine, and environmental management. It is inherited from generation to generation.
- Traditional knowledge is not protected by conventional intellectual property (IP) systems, such as patents and trademarks. However, innovations based on traditional knowledge can be protected by IP systems.

There are two key IP issues related to traditional knowledge:

- (i) **Defensive protection:** Defensive protection refers to strategies to ensure that third parties do not gain illegitimate or unfounded IP rights over TK. These measures include the amendment of WIPO-administered patent systems (the International Patent Classification system and the Patent Cooperation Treaty Minimum Documentation), and substantive examination procedures to identify similarities with prior art. Defensive protection stops people outside the community from acquiring intellectual property rights over traditional knowledge [4].

India, for example, has compiled a searchable database known as TKDL. It contains documented information about traditional medicinal preparations that can be used as evidence well known to traditional communities in India and documented in ancient Sanskrit texts. Defensive strategies might also be used to protect sacred cultural manifestations. The creation of prior art databases was motivated by a well-known case in which the US Patent and Trademark Office granted a patent (later revoked) for the use of turmeric to treat wounds, even though this was a well-known traditional use of turmeric in India and other parts of the world [5].

- (ii) **Positive protection:** of Traditional Knowledge (TK) is aimed at giving TK holders and communities control over the use and commercialization of their TK.

The World Intellectual Property Organization (WIPO) is currently negotiating an international agreement to protect traditional knowledge (TK). Some countries have also passed their own laws (*sui generis* legislation) to protect TK. Additionally, providers and users of TK can sign contracts to protect their interests.

Genetic Resources And IPR

Genetic Resources (GR) is an unique type of intellectual property (IP) subject matter. They include microorganisms, plant varieties, animal breeds, genetic sequences, and other biological materials. GRs are used in a wide range of scientific research and innovation, including medicine, agriculture, and biotechnology. As a result, there are a number of IP issues associated with GRs, including patents, trade secrets, copyright, and technological protection measures.

The World Intellectual Property Organization (WIPO) is working to address the intellectual property (IP) issues associated with genetic resources (GRs) in a comprehensive and practical way. This work complements the frameworks for access and benefit-sharing (ABS) provided by the Convention on Biological Diversity (CBD) and its Nagoya Protocol, as well as other specialized ABS frameworks. One of the key IP issues associated with GRs is patents. Inventions based on or developed using GRs may be patentable, but there are concerns that patents may be granted for such inventions without meeting the ABS requirements. This means that the providers of GRs may not receive the benefits that they are entitled to under ABS agreements [6].

Many WIPO member states want to require patent applicants to disclose the source or origin of genetic resources (GRs), as well as evidence of prior informed consent (PIC) and a benefit sharing agreement (BSA).

Biopiracy

Biopiracy is commonly used to refer to obtaining access to genetic resources without authority.

- Misappropriation happens when biobased innovations are patented without complying with the ABS regulatory requirements.
- Misappropriation of traditional knowledge (TK) and genetic resources (GR) can also be defined more broadly to include unauthorized commercialization resulting from access, derivation of unjustified benefits, or failure to provide for equitable benefit-sharing.

INTERNATIONAL LEGAL FRAMEWORKS:

Trips

The TRIPS agreement does not directly address agriculture or environmental management, but its Intellectual Property Rights (IPR) standards have a significant impact on agriculture practices. IPR protection should promote both technological innovation and the transfer and dissemination of technology in a way that benefits society and balances the rights and obligations of all stakeholders [7]. Countries have the flexibility to adopt measures to protect public health, nutrition and promote the public interest in sectors that are vital to their social, economic, and technological development, even if those measures may restrict IPRs [8].

The TRIPS Agreement is a complex document, but Articles 7 and 8 are two of its most important provisions. They set out the overall goals of the agreement and the flexibility that countries have in implementing it.

- (a) parties to the agreement must introduce a system to protect intellectual property rights for plant varieties. This can be done either by granting patents on plant varieties, or by creating a special system like (*sui generis*) to protect them [9].
- (b) However, it does not require countries to grant patents on plant varieties. Instead, it allows countries to choose between patents and a *sui generis* system, or even to use a combination of the two. This is because there is still debate about whether or not it is appropriate to patent plant varieties.
- (c) It is important for developing countries to have the flexibility to choose a system for protecting plant varieties that is best suited to their own needs.

This is because there is ongoing debate about the appropriateness of patenting plant varieties.

Article 27(3)b patent protection or effective *sui generis* legislation to provide,

1. breeders rights recognition
2. farmers varieties registration
3. Ensuring that farmers have a greater say in the decisions that affect them

The TRIPS Agreement does not require countries to grant patents on plant varieties. Instead, it allows countries to create their own systems (*sui generis* systems) for protecting plant varieties. which can be consistent with international agreements like the Convention on Biological Diversity and the

International Treaty on Plant Genetic Resources for Food and Agriculture that protect farmers' rights and biodiversity.

Another important concern of patentability is Geographical indications (GIs) are a type of intellectual property right that protects the names and symbols of products that are specific to a particular region. GIs can be used to identify and protect a wide variety of food products. GIs are important for food security because they can help to protect traditional food products and promote sustainable agricultural practices. For example, the GI "Darjeeling tea" protects the name of tea that is grown in the Darjeeling region of India. This GI helps to ensure that consumers are getting high-quality tea from the Darjeeling region and that farmers in the region are getting a fair price for their product.

UPOV Convention 1991

Convention on international agreement that protects the rights of plant breeders was first introduced in 1961 and has been updated several times since then. The most recent version, UPOV-1991, is the one that is currently in force; it provides stronger protection for plant breeders than previous versions. Plant breeders' rights and patent rights are similar, but there is one key difference: plant breeders' rights do not extend to the use of the protected variety to breed new varieties. This exception is important because it allows farmers and plant breeders to continue to innovate and develop new varieties. UPOV protection is only granted for plant varieties that are new, different from other varieties, consistent in their characteristics, and stable over time [10]. A plant variety is considered new if it has not been sold or marketed for more than one year in the country where the application for UPOV protection is filed, or for more than four years in other UPOV member countries [11]. Distinct means that the variety can be clearly distinguished from any other variety that was known at the time of the application. Uniform means that the variety has the same characteristics, even after the variety has been reproduced or propagated many times. A plant variety is considered stable if the characteristics of the variety remain the same from generation to generation, even when the variety is propagated.

UPOV provides two main exceptions to plant breeders' rights:

- (a) Farmer's privilege: Farmers can reuse propagating material from the previous year's harvest and freely exchange seeds of protected varieties with other farmers.
- (b) Experimental purposes: Anyone can use a protected variety for experimental purposes, such as breeding new varieties.

Protection under this convention granted for a limited period of time. under the UPOV-1978 the period of protection minimum 15 years protection for forest and wines 18 years [12]. UPOV 1991 extend the minimum period of protection as 20 years for most varieties and 25 years for trees and vines [13]. UPOV-1978 originally prohibited double protection, meaning that a plant variety could not be protected by both plant breeders' rights and a patent. UPOV-1991 allows a plant variety to be protected by both plant breeders' rights and a patent in one country. However, double protection can also be controversial because it can make it more difficult for farmers and researchers to access plant varieties and it was prohibited completely in the 1978 version of the convention. This is why UPOV-1991 only allows double protection in one country.

The Convention on Biological Diversity (CBD)

(CBD) is a treaty that aims to protect and use biological resources in a sustainable way. It has three main goals: (i) To conserve biological diversity (ii) To use biological resources sustainably (iii) To share the benefits of using genetic resources fairly and equitably.

The CBD has also made contributions to IPRs in the context of biological resources. It has established a framework for sharing the benefits of using genetic resources fairly and equitably. This is important because it helps to ensure that the countries and communities that provide genetic resources benefit from their use. It has provided a framework for developing access and benefit sharing schemes, which allow countries to share the benefits of their biological resources with others.

- (a) It is important to ensure that IPRs should not prevent the CBD from achieving its goals.

- (b) We should protect and preserve traditional knowledge because it is often used to manage natural resources and ensure food security.

The CBD has not yet fully addressed the question of ownership of biodiversity-related traditional knowledge, but it has made significant progress in other areas. The CBD recognizes that countries have the right to control the natural resources within their borders. It also helps to ensure that everyone has access to the resources they need to survive and thrive by promoting food security and intellectual property rights (IPRs). When countries adopt the CBD, they agree to make sure that their policies protect and sustainably use natural resources.

Nagoya Protocol [14]:

The Nagoya Protocol helps to ensure that countries and communities that provide genetic resources are fairly compensated for their use. This is important because it helps to incentivize the conservation and sustainable use of biodiversity.

Under Article 5 of the CBD:

- (a) Countries that provide genetic resources or acquire them in accordance with the CBD have the right to share in the benefits that come from using those resources [15].
- (b) The sharing of benefits must be fair and equitable, and must be agreed to by both the provider and user of the genetic resources.
- (c) All countries must pass laws and make rules to ensure that the benefits from using genetic resources held by indigenous and local communities are shared fairly and equitably with those communities [16].
- (d) To implement ABS principles, each country must take steps as appropriate.
- (e) Benefits may include monetary and non-monetary benefits.
- (f) Every country must do what is necessary to make sure that the benefits of using traditional knowledge associated with genetic resources are shared fairly and equally with the indigenous and local communities that own that knowledge.

Article 6 access to genetic resources should be obtained through prior consent of concern. the resource countries and indigenous and local communities have the right to decide who can use their genetic resources and for what purposes. Countries must take steps to respect the rights of indigenous and local communities to their genetic resources. The benefits of using genetic resources must be shared fairly and equitably with the people who owns it and the people use them [17]. Article 9 states that countries should encourage people who use and provide genetic resources to use the benefits from using those resources to help protect and sustainably use biological diversity [18]. Countries should consider whether a global system is needed to ensure that people who own and use genetic resources and traditional knowledge benefit from their use, especially when the resources are shared across borders or when it is not possible to get permission to use them. If a global multilateral benefit-sharing mechanism was created, it would be an important tool for promoting the fair and equitable sharing of the benefits from using genetic resources and traditional knowledge. It could also help to support the conservation of biological diversity and the sustainable use of its components globally [19].

Parties to the convention should encourage people who use and provide genetic resources and traditional knowledge to work together to resolve any disagreements. This could include agreeing on the court or other body that will resolve the dispute, the law that will be applied, and alternative dispute resolution methods, such as mediation or arbitration also to take necessary steps to ensure that people have access to justice and that foreign court judgments and arbitral awards can be recognized and enforced [20].

The Protocol casts the obligation on the signatories to take measures to ensure compliance with domestic ABS legislation of the provider country.

The Plant Genetic Resources for Food and Agriculture (PGRFA)

An international agreement signed in 2001 recognizes that farmers play a vital role in protecting and improving the plant genetic resources that are essential for growing food around the world. The agreement obliges member states to protect and promote farmers' rights, including their right to share benefits from the use of their knowledge. The Treaty does not provide property rights to farmers over their knowledge. This is because traditional knowledge is often collective and difficult to define and protect. However, the Treaty does recognize the importance of traditional knowledge and encourages member states to take measures to protect and promote it.

OPPORTUNITIES AND CHALLENGES

As we have seen, IPR has an incentive role in food security for innovations in agriculture, however we still have challenges to overcome like patents can be used to restrict access to new agricultural technologies, which can make them less affordable for farmers in developing countries. Additionally, trademarks can be used to prevent consumers from accessing generic versions of food products, which can lead to higher prices. The law has changed rapidly to protect human inventions. Patent law, which gives inventors exclusive rights to their inventions, was originally based on the idea that there is a clear difference between human creations and things that occur naturally [21].

Here are some examples of the opportunities and challenges of this:

Opportunities

1. The development of genetic engineering has made IPRs even more important in agriculture, because genetic engineering can be used to create new plant varieties and other agricultural products that are protected by IPRs.
2. The UPOV Convention has been changed to allow plant breeders to protect their new varieties using multiple types of intellectual property rights, such as plant breeders' rights and patents. This gives breeders more options for protecting their investments and generating revenue from their innovations.
3. Geographical indications (GIs) can help to protect the reputations of food products and their origin, which can help consumers to identify and purchase safe and high-quality food.
4. The TRIPS Agreement has played a significant role in introducing life patents to developing countries that did not have intellectual property protection for agricultural biotechnology before 1994 [22].
5. The creation of a global multilateral system will help us work together to protect biodiversity. The benefits of that system should be used to help protect biodiversity and ensure that it is used sustainably in all parts of the world.
6. Defensive protection can help to prevent biopiracy by making it more difficult for people to steal TK. This can be done by documenting and registering TK, raising awareness of TK rights, and developing legal and policy frameworks to protect TK.
7. GIs can be a good way to protect products manufactured within a specific area without restricting the number of producers in that area or requiring products to be new. This makes them a valuable tool for supporting traditional production methods and livelihoods in rural communities [23].

Challenges

1. The goal of this change is to give plant breeders more control over their creations and to make it easier for them to commercialize them has potential negative impacts of this change. For example, some people worry that it could lead to higher prices for food, which can make them less affordable for farmers in developing countries.
2. Trademarks can be used to prevent consumers from accessing generic versions of food products, which can lead to higher prices.
3. IPRs can also be complex and expensive to enforce. If IPRs make it too expensive for farmers in developing countries to access new agricultural technologies, this can reduce food production and make it harder to feed people.

4. The introduction of life patents in developing countries is a complex issue with a variety of different perspectives. Some people argue that life patents are necessary to incentivize innovation in agricultural biotechnology. Others argue that life patents can harm small-scale farmers and consumers in developing countries
5. Indigenous knowledge systems often view seeds as living things, and many Indigenous peoples believe that seeds should not be owned, sold, or commodified. This creates a paradox for keepers of traditional agricultural varieties, who may need to claim ownership of their seeds in order to prevent foreign entities from doing so first [24].
6. Chinese authorities have canceled over 800 seed registrations in the past two years because the seeds were copies. Experts say that the Chinese seed sector is highly fragmented and has a poor track record of commercializing seed innovations [25].
7. One of the challenges in protecting traditional knowledge is that it is often in the public domain. This means that anyone can use it without permission. However, the intellectual property rights (IPRs) granted to products derived from traditional knowledge can create the problem of biopiracy.

CONCLUSION AND SUGGESTION

In developing countries, the introduction of IPR in food security has its own potential and negative impacts. It is important to strike a balance between protecting the rights of breeders and ensuring that everyone has access to the food they need. countries need to develop IPR policies that promote innovations and protect consumers while also ensuring equal access to resources. here some suggestions to the challenges of IPR in food security;

1. To develop eminent sui generis (tailor-made) laws that protect the rights of indigenous peoples and communities to their traditional knowledge and resources. This would help to prevent biopiracy and ensure that indigenous peoples and communities benefit from the use of their traditional knowledge.
2. Support the development of community seed banks. Community seed banks are owned and operated by communities and can help to ensure that farmers have access to a wide variety of seeds, including traditional varieties. Community seed banks can also play a role in preserving and promoting traditional knowledge and agricultural practices.
3. Provide subsidies or other forms of support to help farmers in developing countries access new agricultural technologies. This would help to reduce the cost of new technologies for farmers and make them more accessible.
4. Enact laws that prevent companies from using IPRs to restrict access to essential goods and services, such as food.
5. Work to develop harmonized IPR standards that are fair to all countries. This would help to reduce the complexity of the IPR system and make it easier for countries to implement and enforce sui generis laws and other measures to protect traditional knowledge.
6. Promote access benefit sharing from the use of genetic resources and traditional knowledge in a fair and equitable way. This could be done through mechanisms such as benefit-sharing agreements and patent pools.

It is important to note that there is no one-size-fits-all solution to improving food security in the IPR regime. The best approach will vary depending on the specific circumstances of each country and their geographical structure.

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