

NAVIGATING THE COMPLEXITIES OF IP IN AGRICULTURE: MILESTONES AND CHALLENGES

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Abstract - The adoption of the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS,) by the World Trade Organization (WTO) propelled the member countries towards the realization of the need to maintain certain minimum standards of protection for intellectual properties. Today, Intellectual Property (IP) has suffused through all spheres of our lives. It holds immense significance in boosting the economies of several nations. There is hardly any sector that has remained untouched by it. IP protection was not given much recognition in the agricultural sector. But, with time, considering the varied aspects of this dynamic and vast sector, IP has also yielded new tones from time to time. The protection mechanisms under the IP regime have taken different shapes for providing suitable protection to the various aspects of the agricultural sector. At present, we have several IP rights recognized in the sphere of agriculture, including, Farmers' Rights, Breeders' Rights, Community Rights, right over the protection of Traditional Knowledge, Right to Access and Benefit Sharing (ABS), etc. With this paper, the authors seek to delve into all the IP protection mechanisms traversing the wide-ranging dimensions of the agricultural sector. This article is an attempt at investigating: (i) the milestones which led up to the current scenario of IP protection in agriculture; (ii) the role that is played by Intellectual Property in strengthening & fortifying the agricultural sector, and (iii) the issues related to IP in Agriculture. An attempt has also been made to explore all the initiatives taken up globally to protect IP in Agriculture, along with the prospective measures that can be taken to address the prevailing issues.

Keywords: Intellectual Property, Plant Variety Protection, Agriculture, Farmers' Rights, PGR

INTRODUCTION

The concept of property was not of much relevance for the people in olden times. Gradually, with the passage of time, the need to denote proprietary rights for different types of properties was recognized as being indispensable. With the advancement of Science & Technology, new inventions came into picture. Many inventors were not very keen on sharing the details of the methods and techniques they used to bring their inventions to fruition. This led to the realization that even such scientific knowledge could be regarded as 'property'.

To incentivize the inventors to disclose their industrial techniques, the intellectual property (IP) in the nature of 'Patents' was introduced. Similarly, to incentivize the authors of different types of works like literary, dramatic, artistic works, cinematograph films and sound recordings, the intellectual property in the nature of 'Copyright' was also recognized under the legal system. Many International Treaties and Conventions like the Paris Convention, Berne Convention, Universal Copyright Convention, etc., were signed to persuade the countries around the world to arrive at a consensus with regards to the protection they deem appropriate for IPs, and also to address issues like the subject-matter, requisite criterion and ambit of protection for such properties.

A general understanding of Intellectual Property Rights (IPRs) puts forward the idea that it is the protection granted over a certain set of incorporeal assets, held or created by an individual or a company. IPRs lend exclusive rights to the author/creator of that property to exploit the asset, as he/she may deem fit. The protection is available against the world and is granted for a limited period of time, depending upon the nature of the said property.



With the passage of time, IPRs have assumed great prominence. This is mainly attributable to the rapid boom of innovations witnessed by the world, post the advent of technological & scientific advancement. Today, the limited domains of intellectual properties can be seen to have proliferated to such an extent that we find new kinds of IPs evolving, every now and then.

Today, IP Law has suffused through all spheres of our lives. It holds immense significance in boosting the economies of the nations all over the world. There is hardly any sector that has remained untouched by it. In the initial stages of its development, the agricultural sector was not given much recognition; but with time, considering the varied aspects of this dynamic and vast sector, IP yielded new tones to take this sector within its ambit of protection.

Agriculture was traditionally viewed merely as a source of food, rural employment and a provider of raw materials for the industrial sector. It operated in accordance with the needs and requirements of the nations. All the nations devised their unique policies to ensure the smooth functioning of this dynamic sector of their economies. Though, with rapid rise in the rate of trade of agricultural goods and a consequent change in the consumption scenario, the need for bringing regulations in this sector caught the world's attention. The gradual realization of the need to bring about international harmonization led this sector to the position it has acquired today. The journey started several years back, but is yet to reach its final destination. There is a significant scope for its improvement and for the recognition of its various aspects even today.

The protection mechanisms under the IP regime have taken different shapes for providing suitable protection to the various aspects of the agricultural sector. These mechanisms seem to vary from country to country and situation to situation. Many political, economic, social and even geographical factors play a major role in influencing the approaches adopted by different countries of the world towards determination of IP protection for agriculture within their jurisdictions.

Thus, with this paper, the authors seek to delve into all the IP protection mechanisms traversing the wide-ranging dimensions of the agricultural sector. This is an attempt at investigating: (i) the milestones which led up to the current scenario of IP protection in agriculture; (ii) the role that is played by IP in strengthening & fortifying the agricultural sector, and (iii) the issues related to IP in Agriculture. An attempt has also been made to explore all the initiatives taken up globally to protect IP in Agriculture, along with the prospective measures that can be taken to address the prevailing issues.

The existing literature is substantial on the points of analysis for implementation of IP rights in Agriculture for specific domestic jurisdictions, but a comprehensive account of the differing approaches adopted by the countries around the world is still lacking in the literature pool. With this article, the readers would be able to gather a comprehensive understanding of the scope of protection of IPR in Agriculture, and would be able to draw out comparisons in the laws of various jurisdictions.

This research is the product of the realization of the fact that the loopholes in the existing framework of IP protection at the global level can be plugged only after capturing the issues prevailing in the domestic laws of the nations. Some domestic as well as international laws are beautifully drafted and are prime facie all-inclusive and substantial, albeit a law is merely a piece of scribbled paper if it is incapable of effective implementation. With this backdrop, the researchers in this paper highlight the gaps in the existing domestic and international laws and attempt to propose an approach that can be employed in order to ensure the better fortification of IPRs in Agriculture.

PROTECTION MECHANISMS FOR AGRICULTURE AVAILABLE UNDER THE IP REGIME

Exercising private rights over naturally occurring phenomenon or substances have always been the subjects of strong controversial debates. This is especially common when the kind of protection asked for, is in the nature of IPRs. Albeit, in recent times, a few exceptions to this idea have come into picture. Earlier, IPR was not even considered to have any potential role to play in Agriculture, but today, there are numerous options available in that area. Some such options in this domain include: Patent Protection

At the time when Patent was a novel IP protection mechanism, the first few legislations or documents dealing with its subject-matter did not perceive agricultural innovations to be suitable candidates for being protected under them. To some extent, that is the case even today. Many patent legislations specifically exclude products of agriculture from the list of protectable subject-matters. *For instance*, the Indian Patent Act of 1970 states:

“Section 3 - What are not Inventions.

..... (h) a method of agriculture or horticulture

..... (j) plants and animals in whole or any part thereof other than micro-organisms but including seeds, varieties and species and essentially biological processes for production or propagation of plants and animals...”

An opposing view came from the United States of America (USA), as per which plants were included under the realm of protection of Patents. The USA became one of the first few nations of the world to recognize plants as patentable subject matter, by passing a unique legislation, *i.e.*, “The Plant Patent Act, 1930”. This legislation was mainly made applicable to the “asexually reproduced plants”. Plants, their parts and components, as well as plant variations, are often automatically made non-patentable under the laws of many nations, if they prohibit biological elements in general. However, whether the exclusion applies to all such elements or just those stated to be present in nature often become the determining criterion in this regard.

Though, it would be wrong to suggest that patent protection is only available for protecting ‘plant varieties’, as this IP also has an important role to play in the protection of several technological innovations to improve the functioning of the agricultural sector, like agricultural equipment, cropping techniques, novel irrigation methods, etc.

Plant Variety Protection

This is a unique system of IP protection granted to the breeders of novel plant varieties. The IP holder obtains the exclusive right to control the use of his created variety of plants and to reap commercial benefits from each use his creation is put to.

The UPOV Convention was the first comprehensive measure to lay down the various essential elements of this unique IPR, which also provided for the eligibility criterion for its grant. This was followed by several other international, as well as national efforts to sharpen the contours of its protection.

Other Protection Mechanisms

Several aspects of agriculture can also be covered under the ambit of protection of IPRs like Geographical Indications, Trade Secret Protections and Copyright.

MILESTONES IN THE EVOLUTION OF IP IN AGRICULTURE

Seed is necessary for the sustenance of life on earth. The choice of granting proprietary rights over it was thus, a quite sensitive concern. Plants and animals were widely thought to be natural products until the last century. The reason for not recognizing the IP in the innovations in crop varieties was mainly due to the fact that they were not considered ‘inventions’, in the true sense of the term, rather were treated as mere ‘discoveries’.

With the passage of time, numerous changes were witnessed which transformed the ways in which agriculture was perceived by the world. The gradual evolution of the IP in Agriculture was a long journey stretching over a timeline transcending several milestones, as herein discussed.

The Paris Convention for the Protection of Industrial Property, 1883

In the International sphere, the first IP Convention for Protection of Industrial Property was the PARIS Convention, in the year 1883. Herein, ‘Agriculture’ was recognized to be an area covered under the category of business/enterprise, possessing rights which could be secured by virtue of Article 1(3) of this Convention. The Article stated:

“Industrial property shall be understood in the broadest sense and shall apply not only to industry and commerce proper, but likewise to agricultural and extractive industries and to all manufactured

or natural products, for example, wines, grain, tobacco leaf, fruit, cattle, minerals, mineral waters, beer, flowers, and flour”.

This provision was merely a step towards the inclusion of agriculture in the international instruments, as the context in which it was drafted and introduced seemed to be ‘for the protection of Trademarks’ and ‘for the indication of source’. This can be deduced from the fact that upon a later Revision of the Paris Convention, which was done in the Second Conference, held at Madrid (1890-1891), a proposal was made for curbing and repressing the false indications of origin.

The initiative of addressing the issue of inclusion of the subject, i.e. ‘Plant Variety Protection’ (hereinafter, PVP), was taken up for the first time in the year 1955. This inclusion was again done within the Paris Convention, where many experts got together to prepare agendas for the Lisbon Conference of the Paris Union, wherein they sought to include the agenda of giving protection to Plant Varieties, but a Committee of experts found this proposal to be “premature”. Even the subsequent efforts made at incorporating this matter same into international instruments failed. Some of these efforts included the Lisbon Conference by AIPPI, ICC and FAO.

General Agreements on Tariffs & Trade

The General Agreement on Tariffs and Trade (GATT) came into existence on October 30, 1947, with the objective to provide a framework for the regulation of international trade.

The perception of agriculture as an investment and profit-making sector became amply clear with its inclusion in the Uruguay Round of talks for the GATT (1986-1994). The World Trade Organization (WTO) was established in January, 1995 as a result of this round itself. But with the passage of time, due to the fierce global competition, many new research projects and experiments came into being. As a result of these researches, several agricultural innovations took place, including the creation of several varieties of Plants. Gradually, the breeders of these plant varieties pointed out their concerns regarding the need to protect their interests under the IP Regime, which ultimately led to the introduction of a unique framework for PVP in the international sphere. This framework was mainly introduced to govern the trade-related aspects of this unique creation of man, *i.e.*, plant varieties.

TRIPS Agreement

One of the major outcomes of the Uruguay round was the Agreement on Trade-related Aspects of Intellectual Property Rights (TRIPS Agreement). This Agreement was adopted around forty years after the introduction of UPOV (*discussed in the following section*) into the system, but it came as a reformative treaty, which introduced and created a universal IP Regime, setting minimum standards for the Member Countries to incorporate into their legal systems. It covers a range of IPs like Integrated Circuits, Trademarks, Copyright, Patent, Designs, etc.


Even though this Agreement pays minimal attention to the PVP system, as compared to an instrument like the UPOV, which was entirely dedicated to this IP, but still holds prominence due to the fact that it provides for the most suitable and adequate protection to this unique form of IP. In fact, it has proved to be more effectual than any other international instrument which provides for any recommendations or rules in this regard.

As of July 2004, 147 states or customs territories were obligated to comply with TRIPS by virtue of their membership in the World Trade Organization (hereinafter, WTO). Additionally, many states (particularly those in the developing world) who became bound by TRIPS had not ratified earlier intellectual property treaties and were thus required to make significant changes to their national laws to bring them into compliance with the Agreement.

The provision of TRIPS which specifically deals with PVP is *Article 27.3(b)*. The relevant part of the Article is thus, herein stated:

“Members may also exclude from patentability:

(b) plants and animals other than microorganisms; and essentially biological processes for the production of plants or animals other than non-biological and microbiological processes. However, Members shall provide for the protection for plant varieties either by patents or by an effective sui generis system or by any combination thereof”.



This is the only provision under this international Agreement, and as evident from the wordings of the same, it does not, in any way relate itself to, or talk about UPOV. So, this is a separate genre of protection given to the plant varieties in the international legal sphere, where the option is entirely left upon the Members of the WTO Agreement, to determine whether they wish to exclude/include plants and animals from the ambit of their patentability criterion, or whether they wish to devise a *sui generis* system to address this issue, in their national legal system. It even leaves the option open to devise a law which provides for a combination of both 'patent system' and '*sui generis* system'.

International Conference of 1957 [PARIS]

The Paris Conference established the basic principles of plant breeders' rights that were later incorporated into the UPOV Convention. At the second meeting of the Conference in November 1961, the International Convention for the Protection of New Varieties of Plants (the UPOV Convention) was adopted.

International Union for the Protection of New Varieties of Plants (UPOV)

The International Convention for the Protection of New Varieties of Plants established the International Union for the Protection of New Varieties of Plants (UPOV) in 1961. It arose as a result of a confluence of events, including the transformation of plant breeding into both a science and a business; dissatisfaction with existing legal and non-legal PVP mechanisms; and, essentially, the collective will of plant breeders and intellectual property organizations. These events triggered the need to establish a body to provide a comprehensive system of governance and guidance for the nations around the world. The nature of guidance expected out of it was with respect to the ways of dealing with the rights of plant breeders and for the protection of plant genetic resources (hereinafter, PGRs). Albeit, it was not the first ever system of protection for plant varieties. There were a few legal and non-legal systems which were already in place, though they did not provide for such an all-inclusive-system to deal with this subject-matter. At present, there are seventy-seven countries that are the Members of the UPOV Convention, that has undergone three revisions till date, *i.e.*, in 1972, 1978 and 1991.

The Convention provides for a legal framework PVP. The key objective of this unique system of protection is "to provide and promote an effective system of PVP, with the aim of encouraging the development of new varieties of plants, for the benefit of society".

International Treaty on Plant Genetic Resources for Food and Agriculture

International Treaty on Plant Genetic Resources for Food and Agriculture (hereinafter, ITPGRFA) provides for an international regime for the protection of Farmer's Rights. The benefit sharing and access related provisions under this Treaty are greatly in contrast to the ones provided under the Convention on Bio-Diversity (CBD).

Under CBD, the conservation and preservation of PGR is one of the most important objectives. Where on the other hand, the key objectives of ITPGRFA include providing food security through conservation, as well as facilitating access to genetic resources under its multilateral system of access and benefit-sharing (ABS), working in harmony with the CBD, in order to ensure a sustainable agriculture and at the same time ensuring food security. No other international Treaty or Convention talks or emphasizes upon farmer's rights in the way ITPGRFA does.

ITPGRFA is a Global Treaty, and it is of great relevance because it has dedicated an entirely separate Chapter to Farmer's Rights. 'Farmer's Rights' have been recognized under the treaty as follows:

The Contracting Parties recognize the enormous contribution that the local and indigenous communities and farmers of all regions of the world, particularly those in the centres of origin and crop diversity, have made and will continue to make for the conservation and development of plant genetic resources which constitute the basis of food and agriculture production throughout the world.



RECOGNITION OF IP IN AGRICULTURE: DOMESTIC EFFORTS

Efforts to address the issue of IP Protection in agriculture have not merely been made at an international level, but also at domestic levels, with countries adopting different approaches towards protection of IP in agriculture. A few jurisdictions with differing stands on the issue, like the USA, European Union, Australia, Africa, Canada, Russia, China & India. Let us have a look at the position in these countries.

United States

The US made its stand clear on the issue of PVP way before the thought of introducing IP in agriculture even implanted its first roots in the minds of policy makers of countries around the world.

In 1930, the US passed its Plant Patents Act to provide patent protection to plant varieties. This Act specifically protected the asexually reproduced plants. It stated:

“Whoever invents or discovers and asexually reproduces any distinct and new variety of plant, including cultivated sports, mutants, hybrids, and newly found seedlings, other than a tuber propagated plant or a plant found in an uncultivated state, may obtain a patent therefor, subject to the conditions and requirements of this title”

In the US, plants and plant varieties, may be protected under utility patents; asexually reproduced plant varieties may also be protected under Plant Patent Act of 1930 which introduces a *sui generis* form of patent protection. Many countries that have signed FTAs with the USA have been obliged by these agreements to grant patents on plants. Most of these countries, however, provide for exceptions relating to plants, with different scope, either in relation to ‘plants’ or ‘plant varieties’. Some laws also make ineligible for patent protection, in general, biological or genetic material, without specific reference to plants.

Europe

The agricultural sector is the main user of the land area in Europe. Statistically, the combined area occupied by the Cropped lands and Grasslands there constitute 39% of the total land cover. Agricultural & associated-sectors generate over 40 million jobs in the European Union. Additionally, due to its diverse climate, highly fertile land and soil, varied farming techniques and resultant high productivity, it takes pride in being one the world’s major producers & contributor/exporter of agricultural products.

In Europe, Agriculture is mainly a commercial activity, and this sector utilizes most of the land there, because of which it shapes various landscapes in the rural areas and also in the major areas of economy. Since Plant Breeding is an activity which enables the Breeders in commercializing their varieties, there are more Breeders than Farmers in most of the European Community. Realizing the need to protect the interests of the Plant Breeders, the European Community became one of the first signatories to the UPOV Convention, as this Convention set it amongst one of its primary goals to protect the rights of the Plant Breeders.

The Union Internationale pour la Protections des Obtentions Vegetables (hereinafter, UPOV) is an international inter-governmental organization established as a result of “The International Convention for the Protection of New Varieties of Plants” and provides for a *sui generis* protection for plant protection under the intellectual property regime. It lays down the foundation for the members of the Convention to recognize the IPR in Plant Varieties.

On the basis of the UPOV, 1991, the European Union adopted the “Community Plant Variety Rights System (CPVR System)”, which is an independent schematic framework for the Plant Variety Protection. This Act is regulated by a EU Council Regulation No 2100/94 [CPVO, 1994].

CPVR system is a system which applies uniformly to all the countries in Europe, but this does not mean that the countries cannot have any national legislation on that point, rather they can draft their domestic law in such a manner that they treat this framework as a blueprint for providing the minimum protection. Though, a cumulative protection is not permitted; *for instance*, the subject-matter of CPVR cannot be a subject-matter of National legislation on Plant Variety Rights, in such a

way that if a PVR is granted under the National Law, which happens to be a subject-matter of CPVR, then the former protection shall remain dormant for the time when the latter remains in effect.

Australia

The Australian government recognizes 'Agriculture' as one of the "five pillars" of its economy. This sector is a contributor of three percent to the country's gross domestic product (GDP). Thus, it is pertinent to discuss the mechanisms employed by the Australian government to keep this pillar sturdy.

Australia's agricultural output is largely exported. Its unique worldwide positioning allows it to provide counter-seasonal supplies to the markets of the northern hemisphere, and its proximity to Asia allows it to capitalize on the increasing Asian middle class's market demands. In fact, in response to rising Asian demand, the Australian government has set a lofty aim of tripling the country's crop output by 2030.

At present, in Australia, new plant varieties are eligible candidates for protection under two IP's, *namely*, Patents and Plant Breeders' Rights (PBRs). So, there are certain overlapping options available for protection under its domestic laws.

Plant Breeders' Rights

In Australia, PBRs are administered under the Plant Breeders' Act, 1994, which is in line with the legislations adopted in most of the UPOV member countries. Under this statute, for a plant variety to be eligible for registration in Australia, it must satisfy a three-fold criterion of 'distinctiveness, uniformity and stability' (DUS Criterion). This criterion is to be tested through the process called 'trialing'. The PBR registration is granted after the Examiner is satisfied with the trialing outcomes. A validity of the PBR is for 20 years for non-woody plants and 25 years for woody plants from the date of award (such as trees and vines).

Patentability criterion

The eligibility conditions for the grant of patent over plant varieties in Australia also requires the satisfaction of a three-fold criterion, *i.e.*, 'novelty, inventive step and industrial applicability'. The claims can cover subject-matters like Plants, plant parts, cells of plants, DNA sequences, etc. The protection is usually not granted over traditionally bred varieties of plants, unless certain technical steps involving intervention by humans are shown to be responsible for the creation of the variety for which registration is sought. Traditionally bred varieties are not *per se* registrable because they are incapable of satisfying the threshold of 'inventive step'. Though, protection is available under the Australian law for Essentially Derived Varieties (EDV) of Plants. The standard patent registration is granted for a period of 20 years. For innovation patent, the period of protection is 8 years.

Africa

Initially, the African farmers were mostly engaged in certain sedentary agricultural practices for the prime reasons that there was diverse land available, with enough resources to cater to their needs. Moreover, the environmental conditions were not favorable for the performance of regular agricultural practices. This gradually resulted in the cultivation of a complex farming culture across the African continent reflecting a potential tradition of innovation through nurturing and usage of a wide range of plant varieties and species, *for instance*: about 200 plant species and 100 varieties of rice.

In southern parts of Africa, at present, women have been reported to store seeds of 10 ecotypes of sorghum and pearl millet at a given period in their homestead granaries. It is the regular farmers of the land that substantially add to the list of innovators in Africa. These regular seed breeders have for instance, unfolded hundreds of varieties of bananas in Uganda. The course of breeding in Africa is a smooth process due to the free exchange of seeds amongst the farmers/breeders. This is mostly due to the attitude imbibed within its people towards appreciating community resource rights instead of private proprietary rights. Currently, the preference of Africa in protecting PGRs is through PVP rather than Patents.



The adoption of the TRIPS Agreement drastically affected the operation of IP laws in the African agriculture. Till then, no other African nation except Zimbabwe, Kenya and South Africa had any system to govern IP in Agriculture. In response to this Agreement, the Organization for African Unity (currently known as 'African Union'), in the year 2000, adopted the "African Model Law for the Protection of the Rights of Local Communities, Farmers and Breeders and for Regulation of Access to Biological Resources (African Model Law)". This model specifically excluded plant varieties from the ambit of Patent protection, and also rejected the application of the UPOV Convention of 1991, as a whole. It inclined more in favour of the specific aspect of PBRs from 1978 & 1991 versions of UPOV and a combination of other specific aspects from different international arrangements like: the TRIPS' approach for establishment of a sui generis regime, along with the inclusion of Access & Benefit Sharing guidelines under CBD and the Farmers' rights conception from International Undertaking on Plant Genetic Resources for Food and Agriculture (IUPGRFA). Despite of being a dynamic and comprehensive, all-inclusive document, the Model law failed to grasp a tight hold in Africa. It merely remained a proposal as no African Nation adopted it. Several countries have time and again exerted significant pressure upon the African countries to adopt a complete adherence to the UPOV Convention of 1991. But the African nations argue that the fact that there exists so much agricultural diversity in Africa, renders a strict adherence to the UPOVian model to be quite a dangerous approach, especially if the interests of African farmers are taken into account. It is argued that the DUS requirements are beneficial to the seed and pesticide industries, but they are exceedingly harmful to African farmers whose production is based on seed diversity rather than uniformity. To compensate for the crop vulnerabilities that may be expected from such DUS-driven breeding, chemicals or genetic engineering will be employed, which the great majority of African farmers cannot afford.

Russia

Russia is a member of the UPOV Convention and provides PVP to recognize and protect the interests of plant breeders and compensate the investors for the expenses incurred by them towards the development of new plant varieties. The protection available is only confined to a special list of genera and species, that is approved by the Ministry of Agriculture of Russia. The responsibility to test for the fulfilment of DUS criterion is conferred upon a specialized body, *i.e.*, the Commission for Testing and Protection of Selection Achievements (*also known as 'Gossort Commission'*). In addition to the DUS criterion, another criteria of 'economic usefulness' is also required to be checked. Those varieties which satisfy all of these requirements are eligible to be included in a special register which is titled as "the State Register for Selection Achievements Permitted for Use (National List)". As far as the patentable subject-matter in Russia is concerned, 'plant varieties and other biological methods' are specifically excluded from the ambit of Patent protection.

Canada

Canada is a member to the UPOV Convention. It has a special legislation for PVP, called "Plant Breeders' Act, 1990". This legislation is based on the 1978 version of the UPOV Convention. Even though the latest version of 1991 has been signed by Canada, the same has not yet been ratified by it, due to which it still does not extend protection to EDVs and harvested materials. The statute extends protection to breeders, researchers and even to the farmers, though to a limited extent, *i.e.*, the farmers have been given the right to save seeds of a protected variety, without the imposition of any requirement to pay royalties to the right holder. The country also has another legislation called the "Seeds Act, 1923", though it does not explicitly talk about PBRs.

As far as the Patent law of Canada is concerned, plants have never found place under its shield of protection. The protection only extends to "within-cell processes of transgenic plants" This protection is similar to the one available under the "Biotechnology Patent Directive of the European Union".



China

Like Australia, China is also a member of the UPOV Convention. The difference being that the former is a signatory to the 1991 Convention, whereas the latter is a signatory to the 1978 Convention.

In China, the Ministry of Agriculture and Rural Affairs is in charge of agricultural plant registration, while the State Forestry Administration is in charge of forestry plant registration. These agencies are in charge of both reviewing and approving applications. In most circumstances, a field experiment is required to verify the fulfilment of the DUS criterion by the new plant variety. Most agricultural varieties in China are protected for 15 years, and vines, trees, and ornamentals are protected for 20 years. There is no protection under this law for the EDV, unlike the Australian law; neither is there a protection available for the 'harvested material' in China.

The *nongmin* (peasant/subsistence farmers) in China are granted a farmer's exemption. They may grow protected varieties of plants, albeit only for their personal use, without getting a prior approval from the rights holder or paying fees. The exemption is only available to *nongmin*, not to any commercial farming activities.

India

Despite having an already available blueprint for protection of Plant Varieties, *i.e.*, the UPOV model, India chose to follow its own path. The TRIPS Agreement was inserted as an Annexure to the WTO Agreement. It laid down the minimum standards to be taken into consideration by the Member countries while devising laws governing IPRs within their jurisdictions.

A provision in the Agreement dealt with the issue of PVP under the IP Regime, and presented the Members with three alternative options to establish a system of protection for this subject-matter. These alternatives were set out in Article 27.3 (b) of the TRIPS Agreement, which has already been discussed in a foregoing section of this paper [3.3].

India automatically became a Member of the TRIPS Agreement by virtue of it being a signatory to the WTO Agreement. Due to this, a pressure for compliance was exerted upon India to devise an IP protection mechanism for Plant Varieties. It made its stand clear by specifically excluding this subject-matter from the purview of Patent protection, and establishing a *sui generis* system for protecting it. This *sui generis* system was concretized with the drafting of a unique legislation which came to be known as "The Protection of Plant Varieties and Farmers' Rights Act, 2001" (hereinafter, The PPV&FR Act).

At a global level, Farmers' Rights were never adequately recognized, until the passing of the Act, as the main focus of IP Protection till that time was on PBRs. Being a country relying greatly on the products of farmers' labour, India found UPOV to be an unsuitable framework of protection to incorporate into its legal system. Even though the UPOV Convention provided for a provision of 'Farmers' Privilege' under its Article 15, the provision was not found to be substantial in essence. It merely had the effect of serving as an 'acknowledgement' of the fact that the interests of the Farmers should be protected, but how and to what extent can they exercise their rights was not comprehensively dealt with.

Even today, there are a lot of concerns raised by the NGO's, social activists, legal scholars and other bodies working for the purpose of raising awareness about farmers' rights. They argue that there is an under-implementation of the Act and thus, a need to revise the law for granting them suitable protection. Even at the International level, very little consensus is there amongst the nations as regards the definition of 'farmers' rights' and with respect to the issue of devising strong legal protection mechanisms for the farmers. This can be inferred from the analysis of the various international conventions and documents like the UPOV Convention, ITPGRFA, TRIPS Agreement, CBD, etc.

Prior to the passing of the PPV&FR Act, there were a few laws/policies already operating for the governance of the agricultural sector. These included the initiatives taken up by the private seed companies for the purpose of protecting the interests of plant breeders. Though in the domain of IPR, PPV&FR Act, 2001 was the first comprehensive legislative initiative.

In addition to PVP, India also laid down a framework for the protection of Biological Diversity, in discharge of its obligations to the Convention on Biological Diversity. This Convention formed the basis for Access and Benefit sharing (ABS) mechanism which came to be regulated in India through the adoption of 'The Biological Diversity Act, 2002'. This Act provides a legal framework for "conservation of biological diversity, sustainable use of its components and fair and equitable sharing of the benefits arising out of the use of biological resources, knowledge and for matters connected therewith or incidental thereto", in India.

INTELLECTUAL PROPERTY RIGHTS IN AGRICULTURE: ISSUES & CONCERNS

Irrespective of the fact that the number of international & national documents are quite a lot, there is still a great scope for improvement in the domain of Agriculture. At several points in time, critics have presented concerns as regards the increasing number of IP Rights granted over the agricultural innovations. Their main contentions have mainly hovered over the fact that IP rights have the potential to pose problems to food security, and a tendency to proliferate the use of some harmful technologies like the terminator technologies, thereby causing an increase in the litigation costs as well. The concerns are not just limited to these aspects, but also extend to issues relating to conservation & access to genetic resources, along with the issue of rendering traditional knowledge under-protected. The IPRs promote investment and innovation, thereby contributing greatly to both, the public as well as the private sectors.

The researchers, breeders, farmers and other contributors to the unique agricultural innovations are rewarded with the rights under the domain of IPRs, but everything is not as rosy as it may seem. These technological innovations cast major negative bearings over some very important stakeholders in the agricultural sector. Thus, it is pertinent to discuss the major issues associated with IP protection in Agriculture. For most developing countries, agriculture constitutes the main source of livelihood. The fact that the food is a necessity for the survival of humans makes it a matter of concern for several critics to IPR in Agriculture. They argue that this phenomenon lends room to invasion of many ethical problems like:

Threat to Food Security

In Agriculture, the aim is to promote the development of more qualitative and healthier food options, and to ultimately ensure food security. On the other hand, aggressive application of IP strategies to agricultural innovations has the potential to promote monopolization of food resources. Though, supporters of the idea of strengthening IP in Agriculture argue that providing protection to the new varieties of plants and good quality food would actually ensure better food security. The reason for this being that protection to new varieties would incentivize the creator of the same to divulge it to the public at large, consequently granting greater opportunity for the public to access these qualitative food resources.

Under-recognition of Farmers' Rights

Several international conventions and agreements have been introduced from time to time for protecting the IPRs of Plant Breeders, but a limited or no attention is paid to the farmers, who are actually the major contributors of knowledge and resources in the field of agriculture. *For Instance*, UPOV Convention was a comprehensive document dealing with the issue of protection of IP in Plant Varieties, but it failed to recognize the contributions and interests of the farmers. In fact, even after undergoing three major revisions, no incorporation of any such provision took place therein, which could effectively address the needs of these groups.

On the face of it, Article 15 of the UPOV Convention casts an impression that the UPOVian model is sensitive to the interests and needs of the farmers, but upon a close reading of the provision, it becomes clear that it is merely an 'acknowledgement' of the fact that the interests of the Farmers should be protected, but how and to what extent can they exercise their rights has not been comprehensively dealt with.

In essence, even though the UPOV Convention provides a certain level of protection to the Farmers' Rights by allowing them to save seeds, many companies and plant breeders have found ways around

this protection to cater to their own interests. One such way in which they have counterpoised the farmers' rights can be observed in the jurisdiction of one such UPOV member country, *i.e.*, Canada. Over the years, several instances have been noticed where seed companies have made the farmers dealing with them to sign what they call "Identity Preserved Growers Agreements" which oblige the latter to make use of only certified seeds from the former and also deliver the harvest to these companies only. Such agreements also often impose a prohibition upon these farmers to save the seeds for replantation purposes. They provide incentives like 'payment of premiums' to the farmers to ensure their compliance with the Agreements.

Similarly, TRIPS Agreement came to provide the Member Countries with three alternative protection mechanisms of protecting the intellectual property in plant varieties, but even this Agreement abstained from mentioning anything about the obligation of the Member countries to protect or recognize Farmers' Rights.

In fact, ITPGRFA, the most promising treaty, which claimed to have come for the rescue of the farmers and to provide them a safe haven under its wings, also failed to serve the objectives it promised to fulfil. It only addressed the needs of farmers to a very limited extent, without actually emphasizing upon the ways in which their rights could be realized under the domestic laws of the nations.

Access & Benefit Sharing: Implementation issues

Many critics argue that the system of ABS, as set out under the CBD, along with Nagoya Protocol has not been effectively implemented by many countries. As per the Convention, the signatories were required to comply with its provisions and consequently introduce provisions in their domestic legislations to facilitate smooth functioning of ABS. They believe that many countries have not planned their ABS operations strategically and therefore have ineffective and poorly functional framework for the same.

For instance, in Argentina, the ABS framework lacks the inclusion of any criterion to set out the environmental standards. Due to this, many of its provinces have not adopted any sound regulations to implement the ABS governing framework.

Similarly, in Brazil the ABS legal regime lacks the ability to regulate the collection of biological material, animal capture, transportation, or the participation of foreign researchers in collecting operations.

The list of such examples is quite lengthy, but the crux of the whole scenario is that ABS Mechanism needs better clarification and implementation at both global and domestic levels, in order to achieve the objectives for which they were introduced in the first place.

Biases in favor of private sector

This is another argument which is also somewhat in relation to the issue of 'food security'. IP protection in the nature of Patent or PBRs provide many incentives to the inventor or breeder. The critics argue that these benefits are mainly directed towards the private sector players, who engage in the development of High-yielding Varieties of seeds or such varieties which have potential to improve management of biodiversity, without actually catering to the public sector.

CONCLUSION & SUGGESTIONS

Over the past few decades, a major revolution has been witnessed in agriculture. Advancement in science and innovation in biotechnology being the major factors which seem to have triggered this revolution. This also led the IP laws to yield new forms in order to bring more such aspects of innovation under its wings.

For the progress of the nations around the world, an improvement in the agricultural sector is an indispensable requisite, and this especially holds true for the developing nations.

There are several unrecognized and under-recognized groups in the domain of intellectual property in agriculture. One of the most under-recognized groups include Farmers. As discussed above, there is an urgent need to tailor a framework of protection for Farmers' Rights at the International level,

in order to ensure that the interests of breeders do not overpower and undermine the interests of farmers.

Further, the recognition of the need for ABS measures was definitely a very unique way of recognizing the interests of the contributors, protectors and preservers of Biological Diversity, but the extent to which ABS has served the interests of the farming communities is still quite debatable. These protection mechanisms sound very pleasant in debates and discussions on the topics of Biodiversity Preservation, Equality in the IP regime, etc., but their implementation is actually not an easy task. All nations are unique in their own ways, owing to the varied differences in terms of their history, geographical locations, climatic conditions, population density, cropping intensity, agricultural productivity, and a plethora of other factors. Therefore, the task of molding or incorporating the recommendations of the international conventions/treaties/agreements must be carried out very carefully. This work necessitates the development of intelligent and pragmatic solutions that are customized according to the unique conditions of each country.

Some considerations which policy-makers must keep in mind while dealing with issues relating to IPR in Agriculture may be captured as under:

- (a) A significant issue for agricultural policymakers is to maintain a steady course in order to reduce the volatility of agricultural markets. Food shortages cause high prices, which are a challenge to societal stability, just as low market prices caused by excess are a threat to agriculture. Thus, efforts shall be made to maintain a balance between IP protection and food security, as far as practicable.
- (b) Farmers and farm laborers account for 70% of the world's impoverished; increasing agricultural prices have the potential to help them transcend poverty in the medium run. A financially sustainable agricultural sector, in which farmers profit from increased prices and begin to engage in agricultural services, would definitely help the whole economy. This would indeed serve to boost their developmental rights. But, for recognizing them and bringing them at par with Breeders under the IP Regime, a stronger and more comprehensive recognition and protection to them at international level should be given. This would ultimately promote their recognition at domestic levels as well.
- (c) An effort shall be made to provide a universal definition to the concept of 'Farmers' Rights' and 'Breeders' Rights' in order to do away with ambiguities and bring the nations all over the world at a consensus in this regard. This would help them in determining the major stakeholders of these rights and thereby become able to grant suitable protection to them.
- (d) Agricultural innovations have flowed from time to time, from both private and public sectors, but on a comparative basis it has been observed that it needs better promotion in the public sector. Therefore, a better funding for this sector would boost its presence in origin in the sector.
- (e) Publishing of the techniques and methods of agricultural innovations also play an important role when the implementation of IPRs is concerned. So, both international & national efforts in this regard to justify and emphasize upon the benefits of publication and the role of IP in stimulating research and development in agriculture.
- (f) As the policies of many countries have been discussed in the foregoing sections, we can draw out at least one definitely workable idea in the direction of better PVP policy, *i.e.*, since some countries have overlapping approaches towards PVP, these countries can benefit greatly by adopting a blue-print or framework through specific Covenants governing different issues under their IP regime.

It is rightly believed that "Brainstorming is the nexus of ideas". When more similarly situated nation leaders & policy-makers apply their minds over the same issue at the same time, the results would definitely prove beneficial for all of them. This model should be conditioned according to the situations prevailing in the member countries and be moldable according to their needs and requirements. *For instance*, for countries as unique as South Africa, where most of the agricultural production is dependent upon 'bio-diversity', a strict adherence to the Uniformity criterion with the DUS model of UPOV would be dangerous.

Adoption of such an approach to create a model law would greatly help the developing countries to voice their opinions and adopt a framework that would cater to their special interests as well.

To conclude, in anticipation for a better future for PVP, we quote the wise words of Eckhart Tolle: *“The power for creating a better future is contained in the present moment: You create a good future by creating a good present”*.

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