

Trade related Intellectual Properties

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INTRODUCTION

Since independence, India has tried to effectively use science and technology for its advancement as major economy in the world. The ushering of "Green Revolution" to support the country's efforts for increasing food productivity has been to due timely interventions based on scientific acumen and technology. Despite these successes, newer challenges like declining and degenerating natural resources, increasing population, emphasis on quality food, nutrition, healthcare and access to better livelihoods are surmounting. There is a growing need to be able to meet these through adoption of newer technologies including biotechnological approaches. Added to this, changes at global level after advent of WTO, has started to build technology-led enterprises with knowledge, as an asset fetching remunerations. Research today is poised to come out of its sheltered existence to a more open era and help institutions face competition. This paper attempts to discuss the implications of TRIPs to agricultural research after India complied with various statutory requirements and identifies areas for attention by researchers for providing the needed scientific prowess to the nation in building intangible knowledge into economically viable IP instruments for international trade.

BACKGROUND

From the inception of General Agreement on Tariffs & Trade (GATT) in 1947, there have been more than eight rounds of multilateral trade negotiations. The eighth Uruguay Round (UR), the longest, was launched in September 1986 in Punta del Este and was signed nearly eight years later in Marrakesh in April 1994. India, being a member of GATT since its inception, was committed to be a part of the round and therefore became a signatory to the World Trade Agreement (WTA), which brought the most significant single package of changes to the International Trading Regime. Agriculture was included as an important issue and this led to the creation of a completely new framework of rules by World Trade Organization, an institution that has replaced GATT (WTO, 2003.) Until the Uruguay Round, agriculture received special treatment under GATT trade rules through exemption, exceptions and loopholes from most of the treaties when applied to manufactured goods. As a result, the GATT allowed countries to use measures disallowed for other sectors (e.g. Export Subsidies) and enabled countries to maintain a multitude of non-tariff barriers that restricted trade in agricultural products. From a situation where controls on domestic trade policies in agriculture did not effectively exist, countries had to move to a situation where well-defined constraints on import barriers, export subsidies and domestic support were to be in place at an international level. Apart from this, agricultural technology was poised to be used in trade and institutions forced to gear themselves to face competition. To ensure a fair level playing ground, the World Trade Agreement features nearly 22 agreements and undertakings. Some of these have a direct impact on farmers' livelihoods, food security and the economic development of the country. However, the most conscientious agreement that affects the functioning of research system has been the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS).

AGREEMENT ON TRADE-RELATED INTELLECTUAL PROPERTY RIGHTS (TRIPS)

The Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) provides for the common protection and enforcement of intellectual property rights, such as copyrights, trademarks and patents, and makes rules intended to limit international trade in counterfeit goods. The agreement recognizes that there are widely varying standards in the protection and enforcement of intellectual property rights and the lack of a multilateral framework of principles. Rules and disciplines dealing with international trade in counterfeit goods have been a growing source of tension in international economic relations, and there is need to make measures for those rights; multilateral dispute settlement; and transitional arrangements. To that end, the agreement addresses the

applicability of basic GATT principles and those of relevant intellectual property agreements; the provision of adequate intellectual property rights and the provision of effective enforcement. (WTO, 2001a)

Part I of the agreement contains the basic principles, such as Article 3: National Treatment: "Each Member shall accord to the nationals of other Members treatment no less favorable than it accords to its own nationals with regard to the protection of intellectual property", and Article 4: Most-Favored Nation Treatment: "With regard to the protection of intellectual property, any advantage, favor, privilege or immunity granted by a Member to the nationals of any other country shall be accorded immediately and unconditionally to the nationals of all other Members." Part II of TRIPS then goes through each type of intellectual property one at a time, describing the standards and rights in each case. These include:

- Copyrights (books, paintings, films, computer programs, certain databases, sound recordings, etc). Members must comply with the latest version (Paris 1971) of the Berne Convention for the Protection of Literary and Artistic Works. Rental rights are detailed, giving authors control over whether or not their computer programs, films, etc. can be commercially rented to the public. Requires that works such as sound recordings be protected from unauthorized copying for at least 50 years.
- Trademarks (brand names, product logos, etc). Defines what qualifies as a trademark: "Any sign [words, numbers, pictures, etc.] or any combination of signs, capable of distinguishing the goods or services of one undertaking from those of other undertakings, shall be capable of constituting a trademark." The right to prevent third parties from using "identical or similar signs for goods or services" is given to owners of registered trademarks, and registration is renewable indefinitely.
- Geographical Indications (place names used to identify products, such as "Champagne" and "Roquefort" cheese). Members must provide legal means so that "interested parties" can stop the use of such geographical indications for products that do not originate from the used place name or do not have the usual characteristics associated with that place name.
- Industrial Designs If new or original, industrial designs must be protected for at least 10 years, allowing the owner of such a design to prevent the manufacture, sale or importation of products that are considered to have used a copy of that design.
- Layout design for integrated circuits India is a signatory to the international agreement administered by WIPO on this subject known as the Washington Treaty. The main obligations of the Washington Treaty are also incorporated in the TRIPS Agreement with some enhancement and cover the protection of the intellectual property in respect of lay-out designs that are original in the sense of being the result of their creator's own intellectual efforts. The obligations include national treatment to foreign right holders and a term of protection for 10 years.
- Patents (for inventions). Members must comply with the 1967 Paris Convention for the Protection of Industrial Property, protecting patents for at least 20 years from the date of filing (with the provision that if the patent holder does not take the product to market, then a government can issue a "compulsory license" to a competitor who will). Member countries are allowed to exclude certain items from "patentability", such as "diagnostic, therapeutic and surgical methods for the treatment of humans and animals; plants and animals other than micro-organisms, 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 of plant varieties either by patents by an effective sui generis system or by any combination thereof."
- Trade secrets and undisclosed information: Undisclosed Information. Institutions must be able to legally protect against disclosure or use of "undisclosed information" such as trade secrets, so long as it has commercial value because of its secrecy, and that reasonable steps have been taken to keep it that way. Members shall protect undisclosed information, which is secret in the sense that it is not generally known among or readily accessible to persons, has commercial value because it is secret; and has been subject to reasonable steps under the circumstances, by the person lawfully in control of the information, to keep it secret. (Part II, Section.7: Art.39.1 & 2.) Members, when submitting un-disclosed test or other data, for the marketing of new pharmaceutical or of agricultural chemical products, shall protect such data against unfair commercial use. In addition, Members shall

protect such data against disclosure, except where necessary to protect the public or unless steps are taken to ensure that the data are protected against unfair commercial use. (Art.39.3)

- Anticompetitive practices in contractual licenses: in view of licensing practices that restrain competition with adverse effect on trade impeding technology transfer, member countries are encouraged to provide legislations that discourage restrictive practices but consistent with TRIPs. These are country specific but guided by international principles.

Part III of TRIPS goes on to describe how member countries must provide effective means for enforcing these intellectual property rights (whether for foreign or domestic holders) and they must apply strong enough penalties to deter further violations. It specifies details on how such enforcement should be handled, such as rules for obtaining evidence, injunctions, damages, destruction of illegally copied goods, making of such copying on a commercial scale a criminal offense, and so on. While Part IV deals with the acquisition and maintenance of IPRs, Part V provides for dispute prevention and settlement. To effect these, the Part VI identifies various transitional arrangements for member countries. Developing countries like India were given the option to comply till 2005 under transitional arrangements.

Until 1989 developing countries including India, refused to enter into detailed negotiations on standards. But the threat of unilateral retaliatory trade sanctions played a role in changing the stand of many developing countries on this matter. For example, China, Brazil, India, Taiwan and Thailand were "investigated" under the 'Special 301' section of the US Trade Acts, and many other countries (e.g. Argentina, Andean Group countries) were repeatedly threatened with trade sanctions in order to obtain changes in their IPR regimes. USA, in fact lodged a complaint with DSB in 1996 on non-compliance by India that was upheld even after an appeal (WTO,1997). Thus, India has amended all the relevant legislations for the various forms of intellectual property as per the mandatory requirements of GATT by January 1, 2000; it is now in the process of implementing the act, which needs to be completed by 2005 (Ganguli, 2003).

INTELLECTUAL PROPERTY

Intellectual Property is defined as those creations of the mind that can be protected by law once they take tangible form. An idea for a story, a recipe handed down through generations of a family, a tune whistled in the street – none of these can be protected by law: but once they are written down, recorded, organized even performed in public, then the laws protecting copyright, designs, or patents, can be invoked to protect the rights and interests of the creator – the copyright holder, the owner of the intellectual property. Intellectual property confers on individuals, enterprises or other entities the right to exclude others from the use of specific intangible creations. The peculiar feature of such rights is that they relate to pieces of information that can be incorporated in tangible objects. Protection is given to ideas, technical solutions or other information that have been expressed in a legally admissible form and that are, in some cases, subject to registration procedures.

For researchers in agriculture, technologies generated were hitherto used for solving problems in food production and exchanged with peers for development purposes without any commercial binding. This was more so in public sector institutions. Till recently most research in agriculture was in public sector institutions. The scope of biotechnological tools in providing solutions to like increasing productivity in face of dwindling natural resources, combating abiotic and biotic stresses etc., has started an influx of other players including the MNCs. Hence, a need has now come to identify areas, which can be used as effective and strategic IP instruments. Some of the intellectual properties as relevant to the agriculture sector along with the statutory provisions as on date provided by the national legislations in compliance with TRIPs are discussed below.

BUILDING OF IP ASSETS IN AGRICULTURAL RESEARCH

Copyright: is meant for original literary work, dramatic work, musical work, artistic works cinematographic films, records. The Copyright Act, as amended by the Copyright (Amendment) Bill, 1999 seeks to comply with the TRIPs requirements. Under Article 14 of the TRIPs Agreement, the term of protection, available to performers, shall last at least until the end of a period of fifty years computed from the end of the calendar year in which the performance

takes place. Section 38 of the Indian Copyright Act, 1957, *inter alia*, provided for the performers' right to subsist for twenty-five years from the beginning of the next calendar year following the year in which the performance had taken place. The amended Copyright Act has extended the term of protection of performers' rights from twenty five to fifty years. A new section has been inserted after Section 40 of the principal Act and provides for power to the Government to extend the provisions of the Copyright Act to broadcasts and performances made in other countries, provided these countries extend similar protection to broadcasts and performances made in India. This provision shall benefit Indian broadcasting organizations and performers and allow them to receive reciprocal protection for their rights in other countries, which are signatories to TRIPs. (CIPRA, 2003.) This has ushered in comprehensive changes and brought the copyright law in line with the developments in satellite broadcasting, computer software and digital technology. The amended law has made provisions for the first time, to protect performer's rights as envisaged in the Rome Convention. Several measures have been adopted to strengthen and streamline the enforcement of copyrights. These include the setting up of a Copyright Enforcement Advisory Council, training programs for enforcement officers and setting up special policy cells to deal with cases relating to infringement of copyrights.

Agricultural researchers would perhaps be able to use this IP asset for literary works. But the rich heritage of our country can also be built in this IP by researchers documenting the original art. Identifying creators at grassroots and facilitating their protection would be some of approaches to be undertaken in this instrument. Traditional motifs like in Kalamkari art, Tancoi, Madhubani paintings, are examples. In the age of IT, this form of IPR is also relevant to agricultural researchers involved in software, web site development and all forms of electronic publishing. Institutions need to be stringent on use of legal versions and respect the rights of the owners as per the amended Act of copyright (1999). Infringement means commercial exploitation of the work in any form by a person without authority.

Design: A design includes features of shape, configuration, pattern, ornament or composition of lines and colours applied to article in two or three-dimensional form by any industrial process. The process can be manual, chemical, mechanical or combination of all. The grant is for 10 years initially and non-renewal leads to it becoming public property. The Indian Design Act, 2000 with its subsidiary legislation is in force in compliance with TRIPs provisions. (IDA, 2000). For agriculture sector, forms of designs of textiles patterns, ornaments, embossments that are new, original, and industrially applicable. Traditional heritage in textiles, folklore, toys, village artifacts are all areas to which protection can be extended under this Act. Researchers can build portfolios based on indigenous knowledge of communities for grant of IP protection under this asset.

Trademark: is a sign that individualizes the goods of given enterprise and distinguishes them from the goods of its competitors. It is limited to word marks, abbreviations, names, elements, and hologram. When applied to articles of commerce it is with a view to indicate to the purchaser that they are the goods manufactured or dealt in by particular person as distinguished from similar goods manufactured or dealt in by other persons. It helps to identify the product and its origin, guarantees its unchanged quality, and advertises the product. It also confers on the proprietor a kind of monopoly right over the use of the mark, essential to protect it and the goodwill attached to it, prevents the use of fraudulent marks on merchandise. Items likely to cause confusion, marks, obscene, religious sentiments, and of society, Official seals, identical marks are not considered for registration under this protection. Such distinguishing marks constitute protectable subject matter under the provisions of the TRIPs Agreement. The Agreement provides that initial registration and each renewal of registration shall be for a term of not less than 7 years and the registration shall be renewable indefinitely. Compulsory licensing of trademarks is not permitted. Keeping in view the changes in trade and commercial practices, globalization of trade, need for simplification and harmonization of trade marks registration systems etc., a comprehensive review of the Trade and Merchandise Marks Act, 1958 was made and a Bill to repeal and replace the 1958 Act has since been passed by Parliament and notified in the Gazette on 30.12.1999. This Act not only makes Trade Marks Law, compliant with TRIPs but also harmonizes it with international systems and practices.

A new feature of TM Act 1999 was the inclusion of service marks provision for registration for collective marks for first time in India. (TM Act, 1999) Marks used in commerce can be applied to both agricultural and industrial products and services. For instance, trademarks are used to market seeds or spraying services and need to be built for an

advantage. While trade mark as an asset may not be directly relevant as on date to research activities, with value addition of agricultural commodities and need for rural sector to become competitive in their product and services becoming reality, these may evolve to be important. Indigenous communities can build for protection of local signs for local goods. Further, some of the emerging issues under this IP are tussles between trademarks and domain names. Distributed Database Named System (DNS) of Internet is responsible for assigning the TCP/IP nos. and often trademarks are used for these. But very often, these are leading to deliberate confusion and complaints of grabbing TM are now referred as cyber squatting.

Geographical Indications: One category of commercial marks more often used in agriculture than industry is geographical indications, including appellations of origin. Geographical Indications of Goods (GI) are defined as that aspect of industrial property, which refers to the geographical indication referring to a country or to a place, situated therein as being the country or place of origin of that product. Typically, such a name conveys an assurance of quality and distinctiveness, which is essentially attributable to the fact of its origin in that, defined geographical locality, region or country. Under Articles 1 (2) and 10 of the Paris Convention for the Protection of Industrial Property, geographical indications are covered as an element of IPRs. They are also covered under Articles 22 to 24 of the Trade Related Aspects of Intellectual Property Rights (TRIPS) Agreement.

These are marks associated with products originating from a country, region or locality where the quality, reputation or other characteristics of the product are essential attributable to its geographical origin. Most geographical indications relate to agricultural products or those derived from them, more specifically as in the case of wines and spirits. Protection of such marks prevents third parties from passing off their products as those originating in the given region. Famous examples are champagne and Scotch whisky. Art.22 of the TRIPS indicates GI indications to recognize that goods that have originated in an area where the given quality of goods is attributed to that area. It prevents others to misuse/unfair trade practice. GI depends on acceptance by members of the group and countries are not obligated to grant GI if country of origin is not protecting. India has submitted two proposals to WTO along with Egypt, Cuba, Pakistan, Indonesia where it requested for additional protection as given to wines and spirits be extended to other products as well. India has put forth that under Article 24 of TRIPS, work needs to be expedited so that benefits may extend to wider range of products. This was addressed in the Doha Declaration too but due to subsequent confusion among member countries on other issues, this could not be sorted out as proposed during the Cancun summit.

Appellation of origin is a geographical indication that declares the quality of goods derived essentially or exclusively from an area of production. This instrument is being administered by WIPO as per Lisbon Agreement, 1958 and was limited to some EU countries viz. Italy, France etc., (Chaturvedi, 2002). EU signed plurilateral agreements with Australia, New Zealand for phasing some of European names for wines. In contrast, geographical indication is a notice to individual or group that a given product originates from a given area. Geographical indication is a broader term. All appellations are geographical indications but all geographical indications need not be appellations. Plant varieties developed with traditional knowledge and associated with a particular region can also be protected as geographical indications. The advantage in such protection is that there is no limitation of time but the benefits from this protection emanates over time and familiarity.

India, as a member of the World Trade Organization (WTO), enacted the Geographical Indications of Goods (Registration & Protection) Act, 1999, which has come into force with effect from 15th September 2003. (GI Act, 1999). This Act has been enacted for in India for first time. The proposed features include: Registration of GI in specified classes, Prohibition of registration of certain GI, compulsory advertisement of all accepted G.I, provision of infringement, higher level of protection, GI prohibited for registration as T.M, appeal provision, penalties and protection of homonymous G.I. The Act provides for activities of processing in case of manufactured goods. The Registrar of Geographical Indications maintains the national register. A modern geographical indications registry (GIR) has been established at Chennai in July 2001. It has commenced basic work to receive and process applications. A website has already been launched and it is in process of getting upgraded to an integrated, interactive IP portal soon.

The GI can be developed into a very powerful instrument especially in agriculture including traditional goods. Sahai, 2000) With the national legislation in place, researchers would need to concentrate on building data and evidences for grant under this asset. The implication of this instrument is that it gives right to the communities /people who produce products to prevent others from using the geographical name in marketing produce not originating in defined areas (Gupta, 2003), especially in areas of traditional and ethnic knowledge. Short-listing items for their registration as GIs is an immediate concern and researchers would need to build strong portfolios based on scientific evidences.

Trade Secret: provides protection to persons/institutions on information, which is lawfully under their control from being disclosed to, acquired to or used by others without their consent. Thus under TRIPs members shall protect undisclosed information which is secret in the sense that it is not generally known among or readily accessible to persons, has commercial value because it is secret; and has been subject to reasonable steps under the circumstances, by the person lawfully in control of the information, to keep it secret. (Part II, Section.7: Art.39.1 & 2. of TRIPS). Members, when submitting undisclosed test or other data, for the marketing of new pharmaceutical or of agricultural chemical products, shall protect such data against unfair commercial use. In addition, Members shall protect such data against disclosure, except where necessary to protect the public or unless steps are taken to ensure that the data are protected against unfair commercial use (Art.39.3).

Trade secret protection can be used by the agricultural sector to protect, for instance, hybrid plant varieties. Thus, even in countries that do not recognize plant breeders' rights, the use of hybrids gives a certain degree of appropriability as long as it can be kept secret. Trade secrets can be protected against third party misappropriation through laws relating to unfair competition or to restrictive trade practices or to contract law. In the United States there are separate trade secret laws at the State level. Protection of trade secrets is not limited in time, unlike patents; the disadvantage of this type of protection is that it is lost the moment it is discovered independently by a third party. The advantage, at least to the proprietor, is that, unlike patents, there is no obligation to disclose the inventive or creative ideas to society. Some developed countries protect test data submitted for obtaining marketing approval of agricultural chemicals from use by third parties for a limited period of time, generally for 5 or 10 years. Such protection gives exclusive marketing rights to time. In agriculture it is for drugs and agricultural chemicals. Although developing countries also require the submission of such test data, no exclusivity is conferred on the originator for any period of time. (Watal, 1998). Thus this instrument assumes importance for major institutions and costs for keeping this are enormous. India has yet to introduce an effective system for data protection that is compliant with Article 39.3 of TRIPs though the system is in place with existing National Official Secrets Act that binds public servants from disclosing or using confidential information in unauthorized manner that affects the sovereignty and integrity of the country.

At the institutional level, it becomes evident that agreements on confidentiality gain prominence in the light of multi-party research programs involving testing at multi locations and many employees. In case of agricultural research questions of material transfer agreements for exchange of plant /animal material and questions of ownership become important. MTAs are agreements between collector and appropriate authorities and govern the arrangements of confidentiality, ownership or acquisition without affecting research for development.

Patent: The purpose of a patent is to provide a form of protection for technological advances. Patent protection provides a reward not only for the creation of an invention, but also for the technologically feasible and marketable. This incentive promotes creativity and encourages healthy competition to develop new technology, which is marketable, useful to the public and desirable for public good.

Patenting has been in vogue from times immemorial. Nucleation and expansion of human settlements brought in the need for organized activity related to food collection, shelter, implements, etc. Structuring of such communities into "duty" or "responsibility" based groups or classes generated a system of evolution of skills within them. These skills were transferred from one generation to another essentially through "in-work experience" and training, resulting in the process of "learning by doing". Protection of the "knowledge" or "skills base" was obvious, as this knowledge was confined to a small group or class of people. With the formation of a number of settlements in different parts of the world, improved mobility and communication, information and knowledge got transferred across these societies.

There were informal ways of recognizing and rewarding the innovators. Value added goods with novel features fetched higher returns. However, the need for a formal system of assuring "protection" to inventors for their innovations was essential to encourage further technical developments, fair trade-practices and competition.

The modern patent system was catalyzed with the onset of the industrial revolution, when exploitation of inventions for commercial benefits became fairly common. The patent system underwent changes to keep pace with the rapid advances in science and technology and the evolving international trade practices. This demanded that trading partners have a rational and harmonized patent system, which saw the setting up of various regionalized patent conventions such as the Paris Convention, the European Patent Convention, the Patent Cooperation Treaty (PCT), etc. The rapid advancement in various fields such as biotechnology, information technology, speciality materials etc., is a result of intense cross-fertilization of ideas from a number of fields. For example, cloning techniques use methods from chemistry, physics, computer sciences, engineering, etc. In view of this, it is becoming increasingly difficult to clearly identify what is "obvious" and/or on "morality and societal responsibility", and "religion" are emerging debates which are expected to influence matters related to IPR in due course.

With globalization and restructuring process globally, filing of patents is enhanced in developed and developing countries. The entire process of patenting and enforcements are now realities world over. IPR management incorporation into work systems is now regarded as highly productive and a necessity. Thus, the purpose of a patent is to provide protection for technological advances (inventions). It provides an award for the disclosure of the creation of something new as well as for further development, or refinement, of existing technologies. Characteristics that invention must have in order to be patent protected are:

1. *New invention – i.e. the invention must never have been made before, carried out or used before or made public before the date it is filed. It should be novel.*
2. *Non-obvious and inventive- A sufficient advance in relation to the state of art before it was made to be considered worth patenting. It should involve an inventive step if when compared with what is already known, it would not be obvious to someone with a good knowledge and exposure of subject.*
3. *Industrially applicable – It needs to be of use in some way. An invention should be applicable or used in some of kind of industry. This means that the invention must take a practical form of an apparatus or device a product such as new substance or method of operation.*

Industry is meant in its broadest sense as anything distinct from purely intellectual or aesthetic activity. It does not necessarily imply the use of a machine or manufacture of an article. Agriculture is included. Articles operating in manner contrary to well established physical laws are regarded as not having industrial application.

Article 27 of TRIPS is a set of provisions, which member countries have to follow while formulating their national patent laws. Though India had a liberal patenting system, 1970 Act was in direct contradiction to Articles 27 (27.1,27.2,27.3). India as a developing nation took advantage of 10 years time and then sought to amend its Act. The first amendment was in 1999 with retrospective effect from 1995. The "First to file" character was retained but the ordinance sought to allow product patents, with a duration of 20 years, grant of compulsory license based on merit, workable nature of patents and burden of proof on infringement on plaintiff and not the infringer. While drugs and medicines, agrochemicals could go for product patents now, the applications would seen only after December, 2004 and therefore, provision of mail box facility was given. Such products qualify for Exclusive Marketing Rights (EMR) under certain conditions defined. Critics have many concerns with these articles of TRIPs, such as the involvement of the pharmaceutical industry, which had a strong influence on TRIPs negotiations. There are fears that countries such as India, Argentina and Brazil may have to abandon policies that allow them to produce drugs locally and make them available at affordable prices. However, the recent measure by WTO to accede to the case of developing countries as put in Doha round of talks has put most contentious issues of TRIPs behind. Patents are probably the most important IPR today for agricultural goods and services as they provide, the strongest protection on patentable plants and animals and biotechnological processes for their production. Patents universally give the patentee the right to prevent third parties from making, using or selling the patented product or process. However, they have to be disclosed to the public through the patent documents. This enables researchers to develop further useful products or services. The term of a patent is not the same for all inventions. For eg, process patents relating to drugs and food are allowed five years from the date of sealing of patent, and seven years from the date of patent which ever is the

shorter. For all other patents the term is fourteen years from the date of the patent. This is subjected to the payment of a renewal. The recent amendment on patent Act in 2002 (IPA, 2002) now provides a uniform term of 20 years to all to all inventions as per Article 33. It also clearly specifies some areas not patentable. These are:

- An invention which is frivolous or which claims anything obviously contrary to well established natural laws
- An invention the primary or intended use or commercial exploitation of which could be contrary to public order or morality or which causes serious prejudice to human, animal or plant life or health or to the environment
- The mere discovery of a scientific principle or the formulation of an abstract theory or discovery of any living thing or non-living substance occurring in nature
- The mere discovery of any new property or new use for a known substance or of the mere use of a known process, machine or apparatus unless such known process results in a new product or employs at least one new reactant
- A substance obtained by a mere admixture resulting only in the aggregation of the properties of the components thereof or a process of producing such substance
- The mere arrangement or re-arrangement or duplication of known device each functioning independently of one another in a known way
- A method of agriculture and horticulture
- Any process for the medicinal, surgical, curative, prophylactic, diagnostic, therapeutic or other treatment of human beings or process for a similar treatment of animals to render them free of disease or to increase their economic value or that of their products
- Plants and animals in whole or any part thereof other than microorganisms but including seeds, varieties and species and essentially biological process for production of propagation of plants and animals; (The exclusions states "other than microorganisms" suggesting that microorganisms in principle have not been excluded from patentability)
- A mathematical or business method or a computer program per se or algorithms; (This clarification relating to software is important as it suggests that if software satisfies conditions of patentable inventions and are linked to applications, etc., their grant should not be rejected.)
- A literary, dramatic, musical or artistic work or any other aesthetic creation whatsoever including cinematographic works and televisions productions
- A mere scheme or rule or method of performing mental act or method of playing game
- A presentation of information
- Topography of integrated circuits;
- An invention which, in effect, is traditional knowledge or which is an aggregation or duplication of known properties of traditionally known component or components

The second patent amendment (2002) to the Patent Act 1970 is continuation of the first amendment (1999) addresses also the following issues:

- Harmonization of patent term to 20 years irrespective of the field of technology
- Publication of the patent application 18 months after filing
- Further definition of non-patentable inventions
- Definition of requirements for biological materials
- Faster prosecution of patent application and transparency in the whole process
- Reversal of the burden of proof of process when there is an infringement of process patents. As per the TRIPs requirement the alleged infringer will have to prove that he is not infringing the process patent
- Effective framework for enforcement
- Conditions for "working of patents", "compulsory licensing", "opposition" and "revocation"
- Introduction of Bolar provisions without any time restrictions. Section 107A of the Amended Act states: "For the purposes of this Act
 - (a) Any act of making, constructing, using or selling a patented invention solely for uses reasonably related to the development and submission of information required under any law

- for the time being in force, in India, or in a country other than India, that regulates the manufacture, construction, use or sale of any product;
- Importation of patented products by any person from a person who is duly authorized by the patentee to sell or distribute the product, shall not be considered as a infringement of patent rights”

Definition of “chemical process”: The section 5 subsection (a) and (b) of the un amended Patents Act 1970 does not allow grant of Product Patents for foods, drugs, medicines or even to substances prepared or produced by chemical process including alloys, optical glass, semiconductors and intermetallic compounds. Only process Patents are allowed in these areas. The text of the second amendment also clarifies that for the purposes of Section 5 of the Act, “chemical process” includes biochemical, biotechnological and microbiological process. With reference to biological materials(as per Section 10 of the IPA, 1970),amendments have been introduced to the following requirements for biological materials. These are:

- The specification shall be accompanied by an abstract to provide technical information on the invention
- If the applicant mentions a biological material in the specification which may not be described in such a way as to satisfy clauses requiring the disclosure with the best method of performing the invention such that any one trained in the art can reproduce the invention, and if such material is not available to the public, then application may be completed by depositing the material to an authorized depository institution as may be notified bt the Central government in the Official Gazette accompanied with certificate and by fulfilling the following conditions ,namely:
 - The deposit of the material shall be made not later than the date of the patent application in India
 - All the available characteristics of the material required for it to be correctly identified or indicated are included in the specification including the name, address of the depository institution and the date and number of the deposit of the material at the institution (as per the Budapest Treaty of which India is a signatory)
 - Access to the material is available in the depository institution only after the date of the application for patent in India or if a priority is claimed after the date of the priority
 - Disclose and source and geographical origin of the biological material in the specification, when used in an invention”

The amendment retains the “first to file” policy and the “pre-grant” systems of the IP Act, 1970. After examination of applications, and its acceptance by the Patent Controller, it is advertised in Gazette. Opposition can be filed within four months of date of publication of the specification. In addition, now there is provision of Appellate body for any of the parties following dissatisfaction of decision of controller. Further, the amendment also clarifies the grounds of opposition. These are:

- Obviousness and lack of inventive step
- Invention not patentable under the Act.
- Insufficient description of the invention
- Failure to disclose information relating to foreign applications
- Obtaining wrongfully
- Prior publication in any Indian specification
- Prior publication in any other document in India or elsewhere
- Prior claim in a concurrent application
- The complete specification does not disclose or wrongly mentions the source or geographical origin of biological material use for the invention

That the invention so far as claimed in any claim of the complete specification is anticipated having regard to the knowledge, oral or otherwise, available within:

- any local or indigenous community in India or elsewhere

In face of wrongful use of indigenous biological resources or traditional knowledge, additional grounds for revocation in amended act include:

- *The complete specification does not disclose or wrongly mentions the source or geographical origin of biological material used for the invention;*
- *The invention so far as claimed in any claim of the complete specification was anticipated having regard to the knowledge, oral or otherwise, available within any local or indigenous community in India or else where*

Infringement: Infringement of a patent is the violation of the monopoly right confirmed by grant

- *The onus of establishing infringement is on the patentee*

With these amendments, the Act has become TRIPs compliant and also has considered some of problems faced by innovators in India.

Plant varieties: Protection of plant varieties is perhaps yet another important issue for researchers in agriculture. This has been also one of the most discussed issues after TRIPS. Developing countries were obliged to adopt protection of plant varieties by patents or other means. However, crucial issues on how IP protection affects the access of farmers to vital inputs like seeds have been long debated. While formulating its strategy for protection of plant varieties India resorted to consider principles embodied in other allied international agreements. Intellectual property protection for plant materials is of several modes. The US model of plant patents which differs from normal or utility patents. Several countries allow patents on cells too. The sui generis form of plant variety protection (PVP) is yet another type of plant breeders' rights. With biotechnology emerging as a major tool in research and developmental activities, plants on gene constructs, transformed plants can also be patented.

There are several international regimes related to these concerns of developing countries to be considered. The Convention on Biological Diversity (CBD) vests states with sovereignty over their genetic resources and requires prior informed consent and benefit sharing as a condition for access to the resources. The International Undertaking on Plant Genetic Resources FAO-IU (FAO) recognizes farmers' rights. It is under renegotiation, to make it a protocol to the CBD. Article 27.3(b) of the Agreement on TRIPs requires WTO members to protect plant varieties, which involves protecting rights of plant breeders, by effective sui generis systems but without spelling out its position on benefit sharing and farmers' rights. The International Convention of the Union for the Protection of New Varieties of Plants (UPOV) contains provisions on protecting the rights of plant breeders and farmers. First adopted in 1961, it has over the years been modified, significantly by the 1978 Act (UPOV 78) and the 1991 Act (UPOV 91). UPOV 91, urged upon the WTO by the USA for instance, contains extensive protection for plant breeders to the prejudice of farmers' rights and severely restricts the scope of other breeders to innovate around protected varieties (the breeders' exemption), in this way disturbingly affecting the food security and equity goals of developing countries on the whole. UPOV 78 did not limit the farmers' rights and kept the rights of plant breeders within levels supported by some developing countries. Some WTO members have assumed obligations under the other instruments as well. The proposal that UPOV 91 is the sui generis system, raises the alarm that unfavorable regimes could be imposed on unwilling developing countries; and specifically that the obligations of UPOV 91 will be smuggled into the WTO Agreement, making them enforceable under the WTO dispute settlement system, when they were not negotiated in the Uruguay Round to include them in the WTO. India is attempting to become member of UPOV, 1978 but opposition in the country from NGOs has resulted in a PIL being filed. The judgment is awaited. (Gene Campaign, 2003)

At the domestic level, several countries have adopted or will soon adopt laws on plant varieties, but in the context of CBD the laws extend to the rights of farmers and local communities, and regulation of access to genetic resources. The Organization of African Unity has developed a model law encompassing the various concerns in respect of African countries especially for the right to save, use, multiply and process farm-saved seed but not to sell it on a commercial scale.

Taking the above discussion in view, experts in India representing all sectors including farmers' organizations discussed and formulated a model Act for the first time in the world. India has now passed its national legislation namely, "Protection of Plant Varieties and Farmers' Rights Act," (PPVFR, 2000). This novel act not only introduces provisions for the protection of new plant varieties but also builds into the legislation features to protect farmers' rights, provides an administrative framework for benefit sharing between the beneficiaries which in combination of new Indian Patent Act, 1999 and 2002; Trademarks Act 1999; Geographical Indications Act, 1999; and also the Biodiversity Act, 2002. It aims to protect the interests of all and also comply with standards as per the TRIPS. Implementation of this itself is a major challenge to researchers in agriculture. Efforts must be made to understand the Act and sort out conscientious issues allaying fears especially of the farmers whose livelihoods depend and of breeders, communities and others who need the recognition of the knowledge as an economic asset.

Farmer centric approach adapted by seed industry

Introduction of New Seed Development Policy (1988 – 1989) and seed policy 2002, are the significant mile stones in the Indian Seed Industry, which transformed the very character of the seed industry. The policies gave access to Indian farmers of the best of seed and planting material available anywhere on the world. The policy stimulated appreciable investments by private individuals, Indian Corporate and MNCs in the Indian seed sector with strong R&D base for product development in each of the seed companies with more emphasis on high value hybrids of cereals and vegetables and hi-tech products such as Bt. Cotton. As a result, farmer has a wide product choice and seed industry today is set to work with a 'farmer centric' approach and is market driven

Indian choice of not to be complaint with UPOV 91

India became signatory to the Trade Related Aspects of the Intellectual Property Rights Agreement (TRIPs) in 1994. As a follow-up, legislation was required to be formulated. Article 27.3 (b) of this agreement required the member countries to provide for protection of plant varieties either by a patent or by an effective sui generis system or by any combination thereof. Thus, the member countries had the choice to frame legislations that suit their own system and India exercised this option. Such protection will facilitate the growth of the seed industry in the country to ensure the availability of high quality seeds and plant material to the farmers. The Protection of Plant Varieties and Farmers' Rights Act was passed by the Indian Government in 2001. The Act has thus established an independent National Plant Variety and Farmer's Rights Protection Authority with a Chairman appointed by the Government of India and 15 ex-officio and nominated members as well as a subordinate office of Registrar General of Plant Varieties.

Seed policy 2002 and how it positively influenced the system

The national Seeds Policy, 2002 encompasses the thrust Areas that aim to hasten variety development, plant variety protection, seed production, quality assurance, seed distribution and marketing, infrastructure facilities, transgenic plant varieties, import of seeds and planting materials, seed exports, promotion of domestic private sector seed industry and strengthening of the monitoring system. It also recognizes greater role for the private sector in the functioning of the seed industry in the country. With the growth of economic liberalization and facilitative environment for import of best germplasm available in the world, there has been substantial progress in the development of private seed industry.

CONCLUSION

Protected IPs can thus provide the researchers several options for sharing their creations with public. Depending on the need, IPs can be made freely available at no cost or with no obligations as was being done earlier. But in the post-TRIPS era, compulsions due to prevailing environment in international trade may force researchers to adopt options like selling, (which means losing control on their inventions), or transfer through licensing which gives economic benefits to the inventors. Using some of instruments to gain successes in face of competition is to be learnt and researchers need to gear up to build strong IP portfolios for research institutions and use them as bargaining power. However, any exclusiveness in production and marketing will generally result in relatively high prices, which

the users pay for in using or purchasing the product. Therefore, an integral element in the protection of intellectual property is to ensure that there is a balance between the interests of the innovator and institution on one hand and the user on the other hand to harmonize development of knowledge and products.