A study relating to Intellectual Property Rights with special reference to Biodiversity: A Legal Appraisal

Abstract of the Thesis

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Introduction

Man is the finest creation of God and the most precious child of Mother Nature. Man's quest for improving life has differentiated him from other children of Mother Nature. It is this quest which spurs man to invent newer and newer things. But he has reached the conclusion that unless the inventor is suitably rewarded, invention will not take place at the desired pace, and this will have a telling effect on the quality of human life.

In today's age when knowledge is synonymous with power, an individual's intellect is his property and the individual has all the right over this property. Based on this, the concept of Intellectual Property Rights, popularly known as IPRs evolved. There can be no second thoughts about the fact that inventions and innovations are the major factors that have brought about the change from the ape-man to the present man.

In order to encourage inventors, inventions must be protected from being copied by others without compensation for the inventor. But the question arises as to the extent to which the rights of Intellectual Property can be granted. Man certainly has a right over his own invention but can he exercise the same

rights over things that are not his own creation? Is it justifiable to have property rights over the creation of Nature i.e flora, fauna etc? Can IPRs be granted on plants, animals, human body parts or even the entire human body? Are the present laws sufficient to meet all these situations? This study aims at finding answers to these highly debatable issues. This study is a humble attempt of the researcher to address these burning issues within the legal frame work.

Significance of the Research Topic

It is Biodiversity that makes the Earth a unique planet. Man may land on the moon, Mars or even Pluto, the farthest planet from Earth, but his stay can only be temporary. Human life, for anything more than a very short time, would be not just difficult, but impossible without this biodiversity. But though he is aware of this fact, the lure of the lucre has tempted him to play with Nature. Plants and seeds are patented and the very farmers whose ancestors had developed and nurtured new varieties are not allowed to use them without paying royalty to the patent holders. The developed countries patent the indigenous crops of the economically poor but ecologically rich tropical countries by making very minor modifications in them. Crops are genetically modified, which can pose serious threats not only to the environment but also to human health.

In his quest for maximizing profits, he has started patenting not only inanimate inventions and plants, but also living organisms and human body parts. Insatiable greed has finally led to the

cloning of animals and its success would inevitably lead to the cloning of human beings! Genetic material is being patented by human sharks. The scientist or researcher would then own the human clone just like other people own objects.

The developing and least-developed countries are hit the hardest by Intellectual Property protection. Profits preside over people and it is piracy in the name of protection. This does not mean that there should be no IPRs. But a fine balance has to be struck so that genuine inventors are encouraged and compensated for their labour, without at the same time compromising the preservation and conservation of biodiversity.

Several statutes are in force throughout the world for granting Intellectual Property Rights and for the conservation of Biodiversity. While some of the former show a blatant disregard for biodiversity, some of the latter suffer from lack of strict implementation. In order to arrest the furious pace of extinction of several species of flora and fauna, amendments in the existing legislation need to be carried out on a priority basis.

Some of the relevant important Statutes, Rules and Conventions that have been dealt with in this study are Trade Related Aspects of Intellectual Property Rights (TRIPs) (which came into force on 1st January 1995), Union for the Protection of New Varieties of Plants (UPOV) (adopted in 1961 and revised in 1972, 1978 and 1991) and Convention on Biological Diversity (CBD) (1993), at the International level, and the Indian Patent Act, 1970 (with

amendments in 1999, 2002 and 2005), Protection of Plant Varieties and Farmers' Rights Act, 2001 and Biodiversity Related Community Intellectual Rights Act, 2002 at the national level.

Area of the Study

The basic principle of the patent system is that an inventor must be granted a statutory monopoly to exploit his invention upon making a full disclosure of what he has invented. The maximum period for which a patent is granted is supposed to be long enough to give the patentee a reasonable opportunity to exploit the invention. A patent is granted only for an invention that is new and relates to a useful process or product, and is therefore capable of being exploited industrially. Because of the patent system, there is an incentive to inventors who hope for returns from their inventions; the exploitation of the patent gives the public the opportunity to utilize a new product or process and since the patent is published, the knowledge is available to everyone.

It is clear that there are positive aspects of the patent system in terms of principles. But in the name of development or improving the standard of life, the biological resources of one country cannot be made freely available to another country, in the spirit of "common human heritage". It raises serious issues like whether countries should have the right to demand appropriate financial and other returns for the transfer of their genetic material. Do humans have the right to patent other life forms? Should private monopoly rights be allowed on biological

and genetic resources, or on knowledge and technologies related to these resources? What kinds of rights should local communities, who have nurtured and developed biodiversity for much longer than modern societies, have vis-à-vis resources and knowledge? If equality and justice are the basic goals to which all societies ought to strive, how can these goals be achieved in the context of biological resource use?

Even more so than in the case of conservation, these issues are obviously in the realm of the legal, social, political, and economic relations between countries, communities and corporations. Some of the major conflicts and complications in these relations, and the kinds of answers which people are groping for, are explored in this study.

Rationale of the Study

Issues like biodiversity and Intellectual Property Rights, which affect our lives so profoundly cannot be debated within the restricted circle of professional environmentalists. A meaningful IPRs regime has to be built not only to reward the inventor but also to protect and conserve the biodiversity. This study helps us to understand the question of biodiversity and think of measures essential to conserve our Nature without inhibiting the process of development by newer and newer inventions.

Scope of the Study

Human life is not possible without air, water and food. Plants, animals and microorganisms recreate the quality of the air that we breathe, the water that we drink and the soil that produces our food. They recharge and regenerate the basic necessities that make life possible on this planet. Even before the invention of present medical science, plants were providing the natural ingredients for medicines that cured human illnesses for over three-fourths of the human population. Thus they don't just sustain human life; they elevate us from merely 'existing' to 'living'. Hence it becomes our ethical, moral and legal responsibility to conserve biodiversity and be concerned about its destruction. This study persuades us to be serious about biodiversity. While biodiversity has made life possible, human history has tended to erode this diversity. On the one hand, biodiversity nurtures life; on the other, human beings tend to destroy this very biodiversity. Human beings have always strived to conquer Nature, and the commercial age has transformed Nature into a resource to be used and exploited for sale and profit, opening up the animal and plant world to limitless expropriation.

IPRs are important to encourage inventors, thereby making human life more meaningful. However, it cannot be at the cost of biodiversity which is the basis of any life. With IPRs being one of the widest areas of today's legal system, the scope of this study is limited to its interface with biodiversity only. Other aspects of IPRs are not discussed in this study.

Objective of the Study

- To explore in detail the complex issue of patents with respect to biodiversity.
- To study the implications of the free flow of genetic material from the tropical countries to the Western countries, and the dependence of the tropical countries on the West for the transfer of biotechnological products.
- To examine the effects of extension of Intellectual Property Rights to allow patenting of everything that is genetically engineered or produced by humans, not occurring in Nature.
- To demonstrate the harmful implications of allowing patents on innovations in crop and animal species.
- To prevent the devastating effects of patenting crops and animals such as killing of local innovation, destroying local knowledge, disrupting community life, homogenizing production and restricting biodiversity.
- This study aims to prevent the destruction of genetic diversity.
- Protection of local knowledge as common property and stopping its private appropriation by multinational corporations.
- To build up a meaningful conservation policy not only on the support of specific local communities directly connected to their environment, but on a wider public awareness of the nature of the problem, and a generalized rethinking on the developmental trajectory of our society.

- To understand the question of Biodiversity and to think of measures essential to conserve Nature.
- To study the Indian legislation and International Covenants on Intellectual Property Rights and their effects on Biodiversity.
- To study the effects of International Covenants on IPRs specifically related to Biodiversity, on the Indian economy.
- To study the shortcomings of Indian legislation and International Covenants on IPRs for its effective conservation of Biodiversity.
- To provide remedies to bring about harmony between IPRs and Biodiversity.

Hypotheses of the study

Keeping in view the broad objectives of the study and the problems projected in protection of biodiversity from the onslaught of Intellectual Property Rights, the following hypotheses have been formulated-

- Lack of legislations, suiting the needs of both developed and developing countries, has created a wide gap between two diverse but equally important terms, namely Intellectual Property Rights and Biodiversity, the former an integral part of the development of human beings, and the latter guaranteeing the survival of it.
- Because of the amended statutes in the field of Intellectual Property Rights, particularly General

Agreement on Tariffs and Trade (GATT), there is an increased threat to Biodiversity.

- To ensure the conservation of Biodiversity, Traditional Knowledge (TK) must be protected from the ambit of patenting.
- Patentability of genetically modified crops threatens Biodiversity.
- The emerging trend of patenting life forms result in the destruction of Biodiversity.
- Amendments in legislations and expansion of meaning of patentability have resulted in minimization of liberty guaranteed under the *'sui generis'* system to developing countries.
- Biodiversity laws in India need to be brought at par with the Convention on Biological Diversity (CBD), since legislations have failed to achieve their objectives.

Research Methodology

IPRs, especially patents have social, economic and legal repercussions not on any isolated country, but on the whole world and the people in general. Since the study is socio-economic and legal in nature, historical and doctrinal methods have been adopted, because it cannot be properly conducted purely by the experimental or non-doctrinal method.

The relevant data and information are collected from statutory enactments, published rules of National and International Conventions and Rules evolved by the judiciary from time to time

in specific cases relating to patents and biodiversity. The relevant material is thus collected from various primary and secondary sources. Material and information is collected from both legal sources and socio-economic sources like original judgments of various National and International Courts, published works, National and International Journals, Research Papers presented at National and International Seminars, views expressed by NGOs, websites, etc. A comparative analysis has been made of various National Legislations and International Conventions and Instruments.

Overview of the study

The entire study is divided into eight different chapters. Though every chapter is capable of being a separate topic, all the chapters form a part of this entire study.

Chapter I, after a brief introduction of the subject, defines the area of the study. In this chapter Biodiversity and Intellectual Property Rights, especially patents have been dealt with in brief. Intellectual Property Rights are the rights to make, use, and sell a new product or technology, which are granted to the inventor. They are generally granted in the form of patents, trademarks, or copyrights. These rights on intellectual property enable the holder to exclude imitators from marketing such inventions or processes for a specified time; in exchange, the holder is required to disclose the formula or idea behind the product/process. The effect of IPRs is therefore monopoly over commercial exploitation of the idea/information, for a limited period. The stated purpose

of IPRs is to stimulate innovation, by offering higher monetary returns than the market otherwise might provide. A patent is granted only for an invention that is new and relates to a useful process or product, and is therefore capable of being exploited industrially.

The word 'Biodiversity', short hand of biological diversity is a collective term that encompasses not only wild flora and fauna (wildlife), but also domesticated plants and animals. It is the base of our food, medicine and clothing. There is growing concern for the extinction of biodiversity because of the ways in which extraction of natural resources is being carried out. It is now recognised that utilization and conservation of biological diversity cannot go hand in hand.

This chapter also explains the origin of IPRs which can be traced as far back as the 4th century B.C. to Aristotle. But the history of the patent system goes back still further in time to the 7th century B.C. when the Greeks began granting short term exclusive rights to cooks to prepare new recipes in order that the others might be induced to labour at excelling in such pursuits; but the global adoption of the system gradually increased in the course of time. In India there was an old patent law whose origin dates back to 1856. The levy imposed on salt during the British rule was a kind of Intellectual Property Right conferred on the Crown. A protest initiated against such a right by Mahatma Gandhi metamorphosed into a big freedom struggle, ultimately leading to the freedom of the country. In the 19th century, we

could successfully protect the interests of millions against the arbitrary and politically granted IPR, but are finding it difficult to protect our rich heritage, biodiversity, traditional knowledge and the interests of billions of countrymen from the onslaught of IPRs in the 21st century.

In the earlier days, patents were granted only for inanimate things and not for animate or living things. In all the enactments of the patent law, living organisms were kept out. This was not due to any religious beliefs or ethical considerations, but because of the fact that living organisms of plant and animal species were considered to be the 'common heritage' of mankind. Then in 1980, the US Courts allowed the patenting of microorganisms, in 1985 patent protection was granted to a plant and in 1988 to a mouse.

Chapter II, titled 'Biodiversity – Its Genesis and Conservation' focuses on biodiversity, its meaning, levels and its importance to humankind. Biodiversity is defined by the 1992 United Nations Earth Summit in Rio de Janeiro as "the variability among living organisms from all sources, including, *inter alia*, terrestrial, marine, and other aquatic ecosystems, and the ecological complexes of which they are part: this includes diversity within species, between species and of ecosystems". Scientists have distinguished 3 levels of biodiversity – genetic diversity, species diversity and ecosystem diversity.

This chapter outlines the importance and benefits of biodiversity. Biological diversity and its components are the very basis of human survival, providing food, medicine, energy, ecosystem functions, scientific insights, and cultural sustenance to over five billion people of the world. No human life is possible without air, water and food. We entirely depend upon Biodiversity for all these 3 essential elements for sustaining human life. Wild plants and animals still constitute a substantial part of the diet of the majority of the world's rural people. Three-fourth of the world's population is directly dependent on plants and animals (mostly wild) for its medicinal needs, according to the World Health Organization. Agriculture, though technologically sophisticated now, still depends on traditional crop varieties and on wild plant relatives of crops.

There are four main reasons commonly cited in the literature for the benefits of biodiversity - ecological role of biodiversity, economic role of biodiversity, ethical role of biodiversity and scientific role of biodiversity.

Some of the important economic commodities that biodiversity supplies to humankind are related to food, medication, industry, tourism and recreation. Several inventions are also based on biodiversity.

This chapter points out the increasing threats to biodiversity. During the last century, erosion of biodiversity has been increasingly observed all over the world. There has been a sharp decline in the biological and cultural diversity of India over the

last few decades. The relatively harmonious relationship between local communities and nature has soured, primarily due to forces external to both. The dramatic rise in population in the early 20th century and the advent of industrialization and modern technologies are the root cause of loss of biodiversity. Declining local community control over natural resources (e.g. the takeover of forests by British colonialists), the commercialization of these resources for the market, unsustainable development processes, and increasing populations of humans and livestock, are major destructive factors. If innovations in crop and animal species can all be patented and imitations excluded from the market, it would kill local innovation, destroy local knowledge, disrupt community life, homogenize production and restrict biodiversity.

It stresses the need for conservation of biodiversity which has now become a global concern. There are basically two main types of conservation options, *in-situ* conservation and *ex-situ* conservation. *In-situ* conservation means conservation of biodiversity where it is situated, for e.g. setting up protection areas. *Ex-situ* conservation is conservation away from the place where it is situated, e.g. seedbanks.

Chapter III demonstrates the interface between Intellectual Property Rights and Biodiversity. It outlines the history of IPRs. Though IPRs such as copyrights, patents, and trademarks are centuries old, the extension of IPRs to living beings started in 1930, when the U.S. Plant Patent Act was passed, which gave IPRs to asexually reproduced plant varieties. Monopolistic restrictions are no longer limited to technology but have been

extended to plant varieties, micro-organisms, and genetically modified animals in many countries. Ananda Chakrabarty's patent on a genetically engineered bacterial strain opened the floodgates of patents on life.

This chapter points out the requirements for an invention to be patentable. It must be -

- ✓ Non-obvious for someone skilled in the art, i.e. not simply be an extension of something that already exists but require some inventive step
- ✓ Novel, i.e. not previously known
- ✓ Industrially applicable in some way and useful, i.e. utility

Patents can be given for products and processes. They are only applicable in the country in which they are granted.

This chapter also explains the rationale behind granting IPRs. The widest possible dissemination of new knowledge makes for the greatest economics. But if everybody is free to access new knowledge, inventors have little incentive to invest in producing it. IPRs transform knowledge from a public good to private good. Through enhanced market power conferred by IPRs, owners of IPRs can recoup their expenditure in creating new knowledge. Creative minds and innovators thus have an incentive to engage in inventive activities.

The impact of IPRs on biodiversity is discussed in detail. Industrial and commercial interests appropriate the resources and knowledge of resource-rich but economically poor countries

and communities, further 'impoverishing' them or excluding them from technological improvements. IPRs are likely to greatly intensify the trend to homogenize agricultural production and medicinal plant use systems. The result would be serious displacement of local diversity of crops. Farmers who innovate on seeds through re-use, exchange with other farmers, and other means, would be increasingly discouraged from doing so. An engineered organism may produce unanticipated harmful impacts on other species in its new environment.

Hence it becomes our ethical, moral and legal responsibility to conserve biodiversity and be concerned about its destruction. While biodiversity has made life possible, human history has tended to erode this diversity. On the one hand, biodiversity nurtures life, on the other, human beings tend to destroy this very biodiversity. Human beings have always strived to conquer Nature, and the commercial age has transformed Nature into a resource to be used and exploited for sale and profit, opening up the animal and plant world to limitless expropriation. The end result now corrodes our lives.

Chapter IV deals with Traditional Knowledge (TK) in relation to IPRs. It is the information in respect of traditional medicines existing in the society and passed from generation to generation since time immemorial. But its creation and use are part of the cultural traditions of communities. Traditional therefore does not necessarily mean that the knowledge is ancient. It needs to be protected by a type of *'sui generis'* system. A *'sui generis'* (of

its own kind) system of protection is a special system adapted to a particular subject matter, as opposed to protection provided by one of the main systems of Intellectual Property protection, e.g. the patent or copyright system. A special law for the protection of integrated circuits is an example of a '*sui generis*' law. In the case of plants, it means countries can make their own rules to protect new plant varieties with some form of IPRs, provided that such protection is effective.

Patent holders will increasingly claim rights not merely to varieties, but to characteristics that are common to several varieties, thus a patent holder could prevent others from completing research even using totally different genetic systems, and could perhaps also prevent farmers from innovating on their own, other products and varieties with the same characteristic. With the entry of MNCs like Cargill and Monsanto, India's agriculture has become destabilized. MNC seeds are costly, unreliable, and non-renewable. Farmers have become indebted. Unable to find an avenue to eke out a living, a large number of indebted farmers have decided to sell their kidneys. In most extreme cases they have taken their lives due to indebtedness resulting from high input costs. All suicides are concentrated in areas where farmers have become dependent on private seed supplies of MNC seeds.

India's rich stock of traditional medicines based on historical knowledge and traditional heritage has become an eyesore for

transnational companies and other commercial outfits which are engaged in bio-piracy in the name of research and development and getting Indian traditional medicines patented in the respective countries devoid of any international and national legal norms and ethical values.

The news that neem, turmeric and rice, used everyday in almost every household in our country, have been patented and can no longer be used without paying royalty, had sent shock waves throughout the country equal in intensity to those felt during the earthquake of 2001 in Gujarat. Scientists, political leaders, legal practitioners and biologists, all condemned vociferously this patenting of our centuries old Traditional Knowledge by profit-hungry monopolistic US multinationals. The Indian Government reacted swiftly and challenged these patents under the aegis of the Council of Scientific and Industrial Research (CSIR), led by its chief Prof. R.A. Mashelkar, and got them revoked on the ground that their use being Traditional Knowledge of our country, it is not novel, it is ancient.

The US Patent Office has become a haven for multinational bio-pirates. There are a number of items of Indian origin like Jamun, Gurmar, Turmeric, Basmati rice, Neem, Tulsi, Brinjal, etc. which got patented in the US.

Chapter V deals with the legal perspective of Genetic Modification. Genetic modification of crops is an experimental application of biotechnology that involves manipulating the

genetic code of plants to induce them to generate substances they do not produce naturally.

The techniques of modern genetics have made possible the direct manipulation of the genetic makeup of organisms. In agriculture, genetic engineering allows simple genetic traits to be transferred to crop plants from wild relatives, other distantly related plants, or virtually any other organism. The most common genetically modified (GM) organisms are crop plants. But the technology has now been applied to almost all forms of life.

The impacts of genetic modification have caused widespread concern all over the world. On the one hand it provides certain benefits such as higher yield, longer shelf life, pest resistance, etc. On the other hand genetic modification of crops also poses several problems such as inadvertent contamination of food crops, resistance breakdown and ecological risks. A glaring example is the Terminator Technology of Monsanto. Terminator is the popular name for a complex set of experimental genetic manipulations that render seeds sterile through production of a toxin that kills the seed embryo. Terminator will prevent farmers from saving seeds with patented traits, forcing them to buy new seeds each year. As private seed companies selling Terminator seeds push public sector breeding efforts into the background, farmers around the world will have fewer and fewer non-sterile choices. A legal perspective on genetic modification is dealt with in this chapter.

Chapter VI deals with the legal implications of patents on life forms. Man is the finest creation of God. He has proved his supremacy over all living organisms but has not been satisfied with what he has achieved so far. After conquering all living creatures, man now has started challenging Nature and its very creator i.e. God. Until now man was trying to improvise his life, which is a creation of God, but now has taken a giant leap forward to create this life itself! To understand human evolution a mega genome project was carried out which has just concluded successfully. It was a Herculean task but man could do it. Cloning is the first step towards creation of life. Man has started playing God!!!

The cloning of cells has not stopped at the sheep Dolly but has traveled from sheep to mice, calves, pigs, ox, cat, and has finally reached human beings with the cloning of a female human and named 'Eve'.

WTO has forced countries to introduce laws that allow life forms and living organisms to be patented. The ethical and legal questions raised by genetic engineering technology are numerous and unanswered. This area of biotechnology remains virtually unregulated.

Patent law is the primary vehicle which enables scientists to secure exclusive rights to the commercial benefits of their genetic research. There has been a disturbing trend in patent law that extends patent protection to life forms since 1980 when the US Supreme Court ruled that the creation of an oil-eating microbe is

patentable. Since then, the US Patent and Trademark Office (USPTO) has granted numerous patents for newly created micro-organisms, living animals, and for human tissues and genes, breaking a long-standing policy that animate life forms were not patentable.

Patent legislation was not designed for living organisms. The limits of patenting are being set by the Courts using laws written before the invention of genetic engineering techniques. The resulting decisions are inconsistent and the implications of patents on living things are not known. The Indian Patent Act of 1970 did not earlier permit the granting of patents on life forms and related technologies. Unfortunately, these provisions became a casualty of the internationalization of IPR regimes, which is taking place under the UPOV and the General Agreement on Tariffs and Trade (GATT).

Everything on earth has at some time been considered eligible to be treated as property but human beings were excepted. But with the advent of the cloning technology and the patent granted to Gerona Corporation based at California for exclusive commercial rights to embryos created by cloning by the British Patents Office, the day does not seem very far when human beings will once again begin to be treated as commodities to be owned, controlled and traded in. The undesirable effects of cloning have been dealt with in detail.

An international effort called Human Genome Organisation (HUGO), the most ambitious project ever to map the human

genetic structure is under way. Under its Human Genome Diversity (HGD) Project, sponsored by the United States National Institute of Health (NIH), scientists have begun an anthropological hunt for human tissue, hair and blood samples, from indigenous people of the world. The Human Genome Diversity (HGD) Project is taking blood and tissue samples from indigenous peoples of 722 communities throughout the world for genetic studies. This raises troubling questions regarding the definition of genetic materials as "property", the ownership of the genetic samples themselves, and who stands to profit from the commercialization of products derived from the samples. The HGD Project puts the raw resource, that is, the human genes of indigenous people, in the hands of anyone who wants to experiment with them. In doing so, the HGD Project is opening the doorway for widespread commercialization and potential misuse of the samples and data.

Patent laws that were not designed to deal with living organisms are being applied to living organisms without adequate reference to society. They are being used in ways that were not anticipated by the legislators, and the necessary public debate has not been undertaken. There is a series of profound legal, ethical and moral questions raised by the spectre of patenting life forms that has not been answered. The crucial question is whether human DNA is patentable. The advocators of DNA patenting argue that patenting gives a company or an individual temporary custody but not ownership. There is also a debate on what can be patented.

The Human Genome Project has also been explained in detail in this chapter.

Chapter VII lists out the statutory provisions on IPR. For the first time, an International Convention on Intellectual Property was adopted in Paris in 1883 that covered all aspects of Intellectual Property sans copyright. The gap was filled by Berne Convention, 886. In the recent past another convention for the establishment of World Intellectual Property Organisation (WIPO) was signed in Stockholm in 1967. Further, GATT was succeeded by WTO that came into being on the successful conclusion of the Uruguay Round in 1994 at Marrakesh, Morrocco. Twenty-eight multilateral agreements were signed by 124 member countries. The TRIPs Agreement is one of them.

The last few years have seen a range of significant developments related to Intellectual Property Rights (IPRs) and Biodiversity. At least two major International Agreements, both legally binding, deal with this issue: the Convention on Biological Diversity (CBD) and the Agreement on TRIPs of the WTO. In addition, the WIPO and other international institutions are increasingly becoming active on the subject.

This chapter is a modest attempt to discuss the various International Agreements and local legislations and their impact on biodiversity. India, being a rich source of biodiversity and hence the most affected country, had to enact various legislations and to amend certain provisions related to IPRs, either to protect its own interests or under the pressure of WTO.

The Biodiversity Act, 2002, Protection of Plant Varieties and Farmers' Rights, The Patent Amendment Act, are a few of them.

Chapter VIII concludes the research work with the findings and recommendations of the researcher. The granting of patents on life forms have awakened the world to the horrific implications of IPRs on life forms and biotechnologies and have increasingly brought demands for severe curbs on this runaway, out-of-control juggernaut. This new emerging IPR regime has caused a serious threat to biodiversity itself.

Considering the impact of Intellectual Property Rights on Biodiversity, many developing countries including India have made an attempt to enact legislations to check the onslaught of IPRs on Biodiversity. However, due to the short sightedness of the country's politicians who act under the pressures of the profit-hungry MNCs that have always placed profits before people, the present legislations are not enough to protect biodiversity.

The researcher has made suggestions for striking a balance between IPR protection and biodiversity conservation. India has a vast domestic market as well as a vast reservoir of technical, managerial and entrepreneurial skills. It is in our long term interest to have an Intellectual Property protection system that recognizes both, the need for encouraging and rewarding innovation, as well as our key public interest concerns. It must be remembered that as more and more countries adopt

international norms and standards for the protection of Intellectual Property Rights, the export of products from India to those countries in violation of Intellectual Property Rights will not be permissible. The reason is that the world today has become a "global village" particularly as a result of the advances in science and technology- through informatics, telecommunications, mass transportation, etc. Globalisation in human activities is a natural consequence. We should be a part of this globalisation and not adopt an isolationist stance. It will be advisable for us to adopt internationally accepted norms and standards for the protection of Intellectual Property Rights while including provisions that are necessary to protect biodiversity.