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CONTESTATION OVER THE OWNERSHIP, USE AND CONTROL OF PLANT GENETIC RESOURCES: RETHINKING PLANT INTELLECTUAL PROPERTY RIGHTS FROM INDIAN PERSPECTIVE

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Abstract

Plant Genetic Resources (PGRs) have always been the fundamental prerequisite for sustainable agriculture and occupy the pivotal primacy in the Indian agrarian economy. Over many thousands of years the traditional farmers have greatly contributed to the creation, conservation, exchange and utilization of plant genetic diversity; and made it available to the scientist in both public and private sectors for further Research and Development (R&D). The evolution of formal plant breeding and private investment in seed production have resulted a radical change in the legal approach to PGRs, which have been regarded as the "common heritage" and not qualified to be the subject of individual ownership. However, the international intellectual property system as designed under World Trade Organization (WTO) regime directs the member countries for extension of IPRs over the PGRs through suitable legislation considering its socio-economic objectives. In addition to Article 27.3(b) of the Agreement on Trade Related Aspects of Intellectual Property Rights (TRIPs), proprietary claims over PGRs have also been enunciated through the International Undertaking of Plant Genetic Resources (IU) and the Convention on Biological Diversity (CBD). In view of global governance of intellectual property rights (IPRs) and its application to PGRs, India has brought major legislative and policy changes to accommodate its legal framework within the international intellectual property regime. This present paper aims to study the evolution of proprietary rights over PGRs and the controversies around it exploring the socio-legal issues from Indian perspective. It also analyses the effectiveness of the domestic legal system suggesting pragmatic proposals to employ plant IPRs for sustainable agro-economic development.

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I Introduction

PLANT GENETIC Resources (PGRs) have always been valuable economic resources and the fundamental prerequisite for agriculture, which is a "complex technology system"[1] of varied techno-economic institutions. Indian agriculture is characterized by pre-dominance of traditional farmers, who by customary practices have made significant contribution in creation, conservation and utilization of PGRs, and also provides the raw materials for modern Agricultural Biotechnology Research and Development (R&D). Traditional farmers have made significant contribution in seed supply and crop improvement through the age old method of "selecting-saving-resowing", and played the key role in ensuring household food security. The evolution of formal crop improvement and private investment in formal plant breeding have resulted a seismic shift in the legal approach to PGRs. In India PGRs have always been considered as "common heritage" available to all for free use and not qualified to be the subject of individual ownership. However, the international governance of intellectual property as designed under World Trade Organization (WTO) regime directs the member countries to have patent protection for agricultural biotechnology or an effective *sui generis* system or by any combination thereof for protecting plant-related innovations. In addition to Article 27.3(b) of the Agreement on Trade Related Aspects of Intellectual Property Rights (TRIPs), the International Undertaking of Plant Genetic Resources (IU) and the Convention on Biological Diversity (CBD) also recognised proprietary claims over PGRs. In view of the development of intellectual property protection of PGRs at the global arena, India has brought out some separate but inter-connected legislations and related policy changes for effective integration of the domestic legal framework with the global governance of intellectual property rights (IPRs). The ultimate rationale for plant IPRs in agriculture is to promote commercial plant breeding and crop improvement by providing incentives to the formal seed sector. There is a broad consensus that strong protection of IPRs over plant genetic materials has many serious implications upon country's food security, economic development, sustainable use of agro-biodiversity and promoting sustainable innovations in plant varieties, farmers' right to access seed, protection of traditional knowledge and rights of indigenous communities, etc.

In this backdrop the present paper aims to study the contestations over the ownership, use and control of PGRs under new economic world order and to analyze the various socio-legal issues related to intellectual property law of plant. The methods adopted

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1 Dwijen Rangnekar, *Access to Genetic Resources, Gene-based Inventions and Agriculture* 19 (Study Paper 3a, Commission on Intellectual Property Rights, London, 2002), describing seeds as the genetic software, the commentator emphasized that, it is the varietal characteristics, which are of crucial importance in determining the productivity limits of agricultural inputs.

for the present research involve analytical, historical, comparative and critical within the broader realm of doctrinal research methodology. The socio-legal exploration of plant IPRs will be undertaken with an objective to scrutinize the impact of plant IPRs on each of the above issues, and legislative instruments related to agro-biodiversity from Indian perspective. Though the study will focus mainly at the national level, inter-jurisdictional comparisons and references shall be made to assess national legal framework for plant variety protection. Every attempt will be made to analyze the relevant treaties, conventions and legislations to delineate a comprehensive recommendation to address those socio-legal issues from practical point of views.

II Development of Proprietary Rights over PGRs: The Changing Legal Paradigm

The term 'genetic resources'[2] came into use in 1970 and since then various attempts have been made to define PGRs. Generally, the definition of PGRs covers all agricultural crops and a number of their natural relatives having valuable traits of economic and ecological significance. According to the Convention for Biological Diversity (CBD, 1992), PGRs are any living material of present and potential value for humans. The revised International Undertaking of Plant Genetic Resources (IUPGR), 1983 of the FAO defines PGRs as "the entire generative and vegetative reproductive material of species with economical and/or social value, especially for the agriculture of the present and the future, with special emphasis on nutritional plants." This definition emphasises upon the economic, scientific or societal value of the heritable materials contained within and among species. Throughout the civilization humans have bred seed, plants and animals to achieve desirable traits and qualities suitable for different purposes without claiming any proprietary rights over those. However, the legal approach to PGRs has undergone a remarkable change during the past few decades, when those were taken into the scientific laboratories from farmers' field. As observed by Christopher May that, property rights and intellectual property rights "…do not just emerge…[but] are constructed to serve particular interests",[3] the proprietary claim over PGRs was intensified with the momentous development in agricultural biotechnology, in which the private sector played the most important role.[4] The splendid

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2 Genetic resources include any genetic material of plant, animal, microbial or other origin containing functional units of heredity of actual or potential value.

3 Christopher May, *A Global Political Economy of Intellectual Property Rights- The New Enclosure?* 18 (Routledge, London and New York, 2000); From the economist's point of view, property right is an incentive to encourage conduct which is desirable by regulating action of others in relation to that protected interest; Arnold S. Weinrib, "Information and Property" 38 (2) *Univ Tor Law J. 121* (Spring, 1988).

4 Chidi Oguamanam, "Genetic Use Restriction (or Terminator) Technologies (GURTs) in Agricultural Biotechnology: The Limits of Technological Alternatives to Intellectual Property" 4 *CJLT* 59, 61 (2005).

potential of genetic engineering[5] for creating and improving varieties of plant containing beneficial traits, which does not exist within the gene pool, makes the formal plant breeding a lucrative business. Modern agricultural biotechnology requires large scale investment, man-power, intellectual endeavour and substantial risks, therefore, has become the target of precise and stringent proprietary protection through different forms of IPRs. Realizing the importance of PGRs the Multinational Companies (MNCs) and developed countries tried to get control over the PGRs available in the world, by creating germplasm[6] banks with the help of various World Organizations.[7] Those genetic resources are preserved and subsequently made available to the scientist engaged in both public and private sectors for further research and development (R&D), and the product of such research have been monopolised and sold back to the people of the countries from where the resources were collected. New plant varieties as a research product are also protected as 'trade secrets' and released in the commercial market on a contract using terms and conditions alike to license agreements.

The development of plant IPRs can be traced back during 18th Century, but the serious efforts to this subject initiated only in the beginning of the 20th century.[8] Conventional system of intellectual property, specifically the law of patents focused on technical, mechanical or industrial inventions rather than biological resources.[9] Despite the fact that PGRs has enormous economic value, it was consistently regarded as the "common heritage of humankind" and can be used by anyone without claiming individual proprietary rights over it.[10] With the development of modern agricultural biotechnology

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5 This technique is used to isolate a single gene that is responsible for a desired trait (,*.i.e.,* insect resistance, increased protein content, tolerance to drought) and then combined with a promoter sequence for inserting the combination directly into the plant genome. Barbara A. Schaal, "Biodiversity, Biotechnology and the Environment" in Charles Mc Manis (ed.), *Biodiversity & The Law- Intellectual Property, Biotechnology & Traditional Knowledge* 139 (Earthscan, London, 1st ed., 2007).

6 Germplasm is living tissue, which can be a seed or another plant part – a leaf, a piece of stem, pollen or even just a few cells from which new plants can be grown.

7 The most important ones are: CGIAR- International Agricultural Research Centre, IRRI- International Rice Research Institute, CIP- International Potato Centre and ICARDA- International Centre for Agricultural Research in Dry Areas.

8 The discourse of intellectual property protection for PGRs at the global level was initiated primarily by the US. *See*, Chidi Oguamanam, *Intellectual Property in Global Governance: A Development Question* 109 (Routledge, 2011).

9 Ikechi Mgbeiji, "The Juridical Origins of the International Patent System: Towards a Historiography of the Role of Patents in Industrialisation" 5 *J. Hist. Intl. L. J.* 403, 413 (2003). Article 2 of the CBD defines the term "biological resources" to include "genetic resources, organisms or parts thereof, populations, or any other biotic component of ecosystems with actual or potential use or value for humanity".

10 Keith Aoki, "Wees, Seeds & Deeds: Recent Skirmishes in the Seed Wars" 11 *Cardozo J. Int'l & Comp.* L. 247, 257, 305 (2003).

the seed producers started hybridization and other scientific methods to augment desired qualities in new plant varieties, such as better yield, greater uniformity, disease resistance, and so forth taking into account the ever increasing market demand.[11] The rising business opportunity and competition exist in the formal seed production impelled the commercial breeders to claim proprietary protection for the parent inbred lines[12] as 'trade secret'[13] while releasing hybrid seed in the market.[14]

In *Pioneer Hi-Bred International, Inc.* v. *Holden Foundation Seeds Inc.*[15], the Court recognised the protection of "genetic messages" of inbred plant varietal lines under trade secret law provided that reasonable efforts have been taken to safeguard the secrecy of the gene sequence. Protection of hybrid seed through trade secret facilitates the participation of private seed breeders in development, creation and production of seed, which earlier was carried out primarily by the public sector.[16] The first major changes took place in the year 1930 with the introduction of the Plant Patent Act 1930 (PPA) in the United States providing legal protection for investor and discoverer who asexually reproduce[17] distinct and new plant varieties.[18] Under the Act the breeders of new asexually propagated plant varieties were entitled patent-like protection with incentives similar to those provided for the mechanical and scientific development.[19] However, being dissatisfied with such system the commercial breeders demanded for an extension of patenting rights to sexually reproduced plants too. The Congress, in view of increasing demand and lobbying by the private seed breeders enacted the Plant Variety

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11 The process of seed hybridization developed in 1908 and it was commercially marketed in the US during 1920.

12 Inbred lines are lines of genetically stable germplasm, which allowed a progeny seed to grow as plant that is similar to the parent plant. *See*, Debra L. Blair, "Intellectual Property Protection and Its Impact on the U.S. Seed Industry" 4 *Drake J. Agric. L.* 305 (1999).

13 Trade secret is form of protection that provides protection to a particular technology that will never be disclosed. It can also provide interim protection before a patent application is filed.

14 Plant-related innovations can be protected as trade secret when reasonable efforts have been taken to keep the plant variety confidential, secret and out of the public domain. This form of protection for plant-related innovations has been recognized under Article 39 of the TRIPS Agreement.

15 35 F. 3d 1226 (8th Cir. 1994).

16 Rajshree Chandra, *Knowledge as Property: Issues in the Moral Grounding of Intellectual Property Rights* 233-234 (Oxford University Press, New Delhi, 2010).

17 Asexual reproduction produces plants "by grafting, budding, or the like, and produces an offspring with a genetic combination identical to that of the single parent – essentially a clone." *J.E.M. Ag. Supply Inc.* v. *Pioneer Hi-Bred International Inc.* 534 US 124 (2001).

18 Nicholas J. Seay, "Protecting the Seeds of Innovation: Patenting Plants" 16 (3&4) *AIPLA Q.J.* 420-422 (1988-1989).

19 Keith Aoki, "Seeds of Dispute: Intellectual Property Rights and Agricultural Biodiversity" 3(1) *Golden Gate U. Envtl. L.J.* 93 (2009).

Protection Act, 1970 (PVPA), and expanded the intellectual property protection to plants not covered by the PPA, including seed germination.[20] This was a major success for private seed industry in achieving proprietary rights over the plant varieties created and developed by them, which includes the right to sell, import, export, sexually reproduce, or use the variety to reproduce another new variety.[21]

Despite the protection available for plant-related innovations through trade secrets, contracts, the PPA and the PVPA, the seed industry claimed a federal form of intellectual property protection in the form of utility patent[22] prohibiting a plant breeder to gain benefit from the research and development (R&D) efforts, and expenses incurred by the other breeders.[23] Such claim was recognized with the landmark decisions in *Diamond* v. *Chakrabarty*[24] and *Ex Parte Hibberd*[25] and paved the way for broad patents in the field of genetic engineering and plant-related innovations.[26] In *Diamond* v. *Chakrabarty*, recognizing the patentability of living organism the US Supreme Court held that "whether the invention in question is animate or inanimate has no bearing on its patentability as long as it meets the criteria of novelty, utility, and non-obviousness, and as long as it is a product not of nature but of human manufacture."[27] The judicial process of commodification of PGRs was completed five years later when the Court decided the question of patentability of sexually reproducible plant in *Ex Parte Hibberd*, 1985.[28] In 2001, the US Supreme Court again confirmed and extended utility patent protection for sexually and asexually reproduced plants. In *J.E.M. AG Supply* v. *Pioneer Hi-Bred International*[29] the court concluded that newly developed plant varieties are covered by expansive utility patents, and the scope of utility patent cannot be limited by the PPA or the PVPA. Thus, the legislature and judiciary in the United States during 19th century have contributed to a large extent in evolution of intellectual property protection in the arena of agricultural biotechnology, which subsequently led to the

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20 Plant Variety Protection Act, 7 USC Sec. 2402(a).

21 *Supra* n. 20, Sec. 2541.

22 Utility patents were preferred by plant breeders because they allow patenting of the individual components of varieties; *Supra* n. 19.

23 Debra L. Blair, "Intellectual Property Protection and Its Impact on the U.S. Seed Industry" 4 *Drake J. Agri. L.* 315 (Spring, 1999).

24 447 US 303 (1980).

25 227 U.S.P.Q. 443 (T.T.A.B. 1985).

26 In the case *Ex parte Hibbered*, 1986 the US Patent Office for the first time recognized the possibility of granting utility patents on plants. *See*, Jayashree Watal, Intellectual Property Rights in the WTO and Developing Countries 152 (Oxford University Press, New Delhi, 2001).

27 447 US 303 (1980) at 312.

28 227 USPQ 443 (PTO Bd. Pat.App. & Int. 1985).

29 534 US 124 (2001).

development of *sui-generis* system of intellectual property protection asserting private ownership over PGRs.[30]

III Commodification of PGRs: Analysing the Socio-Legal Issues in India

The term 'property' is not self explanatory as the law of property does not focus on the 'thing'; rather it emphasizes the complex bundle of rights, duties, powers and immunities that one has with respect to the 'thing'. Individual ownership was negated for PGRs as it were considered part of the "common heritage of mankind".[31] Moreover, PGRs are naturally propagating species, which carries within it the propensity to reproduce and one time use does not prevent the further use of it. These characteristics constitute the biological barrier to its commodification.[32] To overcome this barrier industry pursued two routes of commodification - the legalistic route, which has to do with legislation making the seed 'ownable' by granting property rights, and the technological route - which is hybridization, recombinant DNA, cloning and making seed sterile after first plantation.[33] Farmers' system of seed supply[34] and crop improvement play fundamental role in ensuring country's food security. It also makes certain that the traditional farmers have access to the stock of different genes for selection, improvement and conservation of traditional varieties that are favourably well conditioned in the local environment where they live.[35] Intellectual property protection of PGRs has significant implications particularly upon right to food, right to health, right to livelihood, right to environment, agricultural system, traditional knowledge, rights of the indigenous people and biodiversity in general.[36] A major impact of patenting PGRs or patent-like rights such as plant breeders' right has been

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30 Chidi Oguamanam, "Intellectual Property Rights in Plant Genetic Resources: Farmers' Rights and Food Security of Indigenous and Local Communities" 11 (3) *Drake J. Agri. L.* 273-305 (2006).

31 C C.S Srinivasan, "Exploring the Feasibility of Farmers' Rights" 21 *Dev. Pol'y Rev.* 419, 420 (2003).

32 The term 'commodification' describes the assignment of economic value to a good which previously has not been assessed in economic terms and turns the good into a commodity.

33 Jack Ralph Kloppenburg, *First the Seed: The Political Economy of Plant Biotechnology, 1492-2000* 10-11 (Cambridge, Cambridge University Press, 1988); Keith Aoki, "Weeds, Seeds & Deeds: Recent Skirmishes in the Seed Wars" 11(247) *Cardozo J. Int'l & Comp. L.* 256 (2003).

34 The farmers in developing countries save, exchange, and sell seeds and other propagating material as common practice.

35 Claudio Chiarolla, "Right to Food and Intellectual Property Protection for Plant Genetic Resources" in Christophe Geiger, *Research Handbook on Human Rights and Intellectual Property* 526-528 (Edward Elgar, Cheltenham, UK, 2015).

36 Josephine R. Axt, M. Lynne Corn, *et. al.*, "Biotechnology, Indigenous Peoples, and Intellectual Property Rights" 27 (CRS Report for Congress, Congressional Research Service, 1993).

the promotion of the control of the private sector over crops and agricultural practices. Acquisition and proprietary control of seed by the corporate body has been commonly viewed as threatening food security and control of domestic food production.[37] Walter Reid stated that, strong intellectual property protection has an impact upon agro-biodiversity.[38] For obtaining intellectual property protection, breeders may develop plant by crossing "plants with desirable characteristics and then inbreeding the resulting plants for several generations until the resulting plant line is homogenenous."[39] The approach of giving more importance to genetic uniformity, which tends to induce mere cosmetic alterations, causes a loss of diversity and creates a greater risk of catastrophic vulnerability of disease.[40] Contrary to the argument that IPRs will ensure food security by incentivize agricultural biotechnology, the apparent imposition of IPRs in agriculture has tended to marginalize weak developing countries as well as impact negatively on their agricultural biodiversity and food security.[41]It will make the developing countries dependable on the charity of bigopolists, who will take the strategic decisions on how to use plant IPRs in agriculture for commercial gain.[42]

The introduction of IPRs over PGRs has also been described as the ownership of life.[43] It has been argued that plant IPRs will deprived the farmers from rightful compensation for the property they already own and from future opportunities of economic importance.[44] While breeders are able to secure property rights over the

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37 M. Mascarenhas and L. Busch, "Seeds of change: intellectual property rights, genetically modified soybeans and seed saving in the United States"46(2) *Sociologia Ruralis* 122-138 (2006).

38 According to him the existing policy framework for the use of genetic resources for food and agriculture favours "centralized crop breeding and the creation of uniform environmental condition, and discourage agro-ecological research or local breeding tailored to local conditions."; Walter V. Reid, *Genetic Resources and Sustainable Agriculture: Crating Incentives for Local innovation and Adaptation* 27 (Biopolicy series No. 2, African Centre for Technology Studies, Nairobi, 1992).

39 *J.E.M. Ag. Supply Inc.* v. *Pioneer Hi-Bred International Inc.* 534 US 124 (2001), at 127.

40 Charles R. McManis, "The Interface Between International Intellectual Property and Environmental Protection: Biodiversity and Biotechnology" 76(1) *Wash. U. L. Rev.* 255-279 (1998), *citing* Bernhard Bergmans, "Industrial Property and Biological Diversity of Plant and Animal Species" 72(6) *J. Pat. & Trademark Off. Soc'y* 601-602 (1990).

41 Naomi Roht-Ariazza, "Of Seeds and Shamans: The Appropriation of the Scientific and Technical Knowledge of Indigenous and Local Communities" 17 *Mich. J. Int'l L.* 940-942 (1996).

42 Peter Drahos and John Brathwaite, *Information Feudalism: Who Owns the Knowledge Economy?* 168 (Earthscan Publications Limited, London, 2002).

43 Vandana Shiva, "Patenting Life Forms: Death for Third World Farmers!" *The Lawyers* 4-8 (April, 1992).

44 Paul B. Thomson, *Food Biotechnology in Ethical Perspective* 166-167 (Springer, Netherlands, 2nd ed., 2007).

varieties they create, the value added by traditional farmer are deprived from the recognition of their own contribution in the formation of new plant variety.[45] For example in India majority of the farmers depend on the age-old practice of seed saving and exchange, which is a major part of seed distribution mechanism as against merely 38% of seed requirement being met by formal agencies like National seed corporations. In the absence of traditional right of seed saving the farmer will have to pay royalty for seeds for each sowing as he can neither multiple nor use them in following seasons. It also results to the problem like unauthorized use of biological resources and traditional knowledge for commercial exploitation without any compensation for such use. In most of the cases the fact remains that the starting point of most research related to PGRs is often the existing traditional ecological knowledge of indigenous and local communities, with respect to those resources. To create new varieties of plant scientists take PGRs from the field to the laboratory, and transfer a single gene from one spot to another within a cell. This single act creates a "Plant Variety" whether or not it causes an actual variation in the next generation, deemed sufficiently "New" to qualify as a subject matter of IPRs. Thus, the ownership, use and control of PGRs under the intellectual property regime has become a contentious issue, which widely touched upon the international legal community and the policy makers at national level during recent past. There is a broad consensus that strong protection of IPRs over biological resources has many serious implications on developing countries especially, in realization of human rights and its protection. The Sub-Commission on the Promotion and Protection of Human Rights in its resolution 2000/7 stated that, "actual or potential conflicts exist between the implementation of the TRIPS Agreement and the realization of economic, social and cultural rights".[46] The resolution was followed in 2001 by a report from the UN High Commissioner for Human Rights. Analyzing the links between TRIPS and human rights instruments, the report asserts the primacy of human rights obligations over TRIPS, to ensure the anticipated knowledge transfer in the field of science and technology since severe inequalities exists between developed and developing countries.[47]

IV International Governance of PGRs: Traversing the Landscape

Proprietary rights over PGRs have been well articulated in multilateral trade negotiation and institutions most notably through Article 27.3(b) of the TRIPS Agreement. Global

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45 *Id.* at 163.

46 David Weissbrodt and Kell Schoff, "The Sub-Commission's Initiative on Human Rights and Intellectual Property" 22 *Neth. Q. Hum. Rts.* 181-215 (2004).

47 *The Impact of the Agreement on Trade-Related Aspects of Intellectual Property Rights on Human Rights*, *Report of the High Commissioner*, U.N. ESCOR, 52nd Sess., U.N. Doc. E/CN.4/Sub.2/2001/13 (2001).

environmental and agricultural instruments such as the International Undertaking of Plant Genetic Resources (IU) and the Convention on Biological Diversity (CBD) also recognise the proprietary claims over PGRs. The issues relating access and proprietary claims to PGRs for food and agriculture were addressed internationally for the first time under the International Undertaking of Plant Genetic Resources (IUPGR).[48] The undertaking seeks to "ensure that plant genetic resources of economic and/ or social interest, particularly for agriculture, will be explored, preserved, evaluated and made available for plant breeding and scientific purposes".[49] The Undertaking affirms the principle that all PGRs – naturally occurring plants, germplasm in seed banks, cultivated plant varieties - are the "common heritage of humankind" and should be made freely available for all without any restrictions.[50] Although, the principles of the Undertaking were merely a nonbinding statement of principles, was opposed by the United States and some European Governments contending those principles contradictory with the International Union for the Protection of New Varieties of Plant (UPOV)[51] and their national patent laws. The principle emphasizing on free availability of PGRs was not acceptable to the developed countries which already had accomplished remarkable development in genetic engineering.[52] This led to the search for an alternative formulation which was achieved after the interpretive resolutions in 1989 and 1991. These resolutions, while reaffirming the principle of common heritage,[53] endeavoured to strike a balance of rights between the formal innovators as breeders of commercial varieties[54] and informal innovators as farmers' varieties.[55] In 1991, the FAO Conference envisaged the development of an international fund on PGRs to foster the implementation farmers' rights and to support PGRs conservation and

48 International Undertaking on Plant Genetic Resources, FAO Res. 8/83, 22nd Sess., U.N. Doc. C/83/REP (Nov. 23, 1983), http://ftp.fao.org/ag/cgrfa/iu/intexE.pdf (last visited Jun.17, 2015) (hereinafter referred to as 'International Undertaking, 1983').

49 Article 1 of the International Undertaking, 1983.

50 *Ibid.*

51 UPOV is a multilateral agreement entered into by the industrialized states to protect plant breeders' rights. It was argued that proprietary rights over plant-related innovations will encourage the plant breeding and enhance genetic diversity.

52 Canada, France, Federal Republic of Germany, Japan, Switzerland, United Kingdom and the United States reserved their position in International Undertaking. New Zealand also reserved its position due to lack of provision relating to plant breeders' rights.

53 Resolution 3/91 recognizes the sovereign rights of nation over their own genetic resources and makes the principle of common heritage subject to states' sovereign rights over their plant genetic resources.

54 Resolution 4/89 recognizes that plant breeders' rights are not inconsistent with the principle of common heritage of humankind.

55 Resolution 5/89 states that the recognition of farmers' rights is not incompatible with the International Undertaking.

utilization, mostly in developing and underdeveloped countries. In 1992, Agenda 21 called for the reinforcement of the FAO Global System on PGRs and its adjustment in harmony with the CBD's outcome. This led to the further negotiations for revising the International Undertaking comprehensively in accordance with the CBD.[56] The negotiations were concluded with the adoption of a binding treaty, the International Treaty on Plant Genetic Resources for Food and Agriculture (PGRFA Treaty).

The conservation and use of biological resources has been one of the most contested issue for both developed and developing countries for more than a decade specially, in the wake of agricultural biotechnology and the extension of IPRs in relation to PGRs. The CBD made an attempt to institute an international foundation agreement to conserve and utilization of the global biological resources.[57] Conservation and sustainable use of biological diversity, fair and equitable sharing of benefits arising out of the utilization of genetic resources and the preservation of indigenous knowledge are the core objectives of the CBD.[58] Realizing the importance of biological diversity, the Contracting Parties to the Convention recognise the sovereign right of the nation states to exploit their own resources and the authority to decide the conditions of access to them.[59] In furtherance of the sovereign rights of the states over their biological resources, Article 15(1) provides that the "authority to determine access to genetic resources rests with the national governments and is subject to national legislation". The Convention mandates that the benefits arising from the commercial utilization of genetic resources shall be shared upon mutually agreed terms and condition between contracting parties.[60] Thus the Convention construct genetic resources a subject that can be owned by the state and no more it remain the 'common heritage of mankind' as it was stated in Article I of IUPGR.

The CBD does not specifically refer to any international IPRs Agreements; however, intellectual property protection for PGRs falls within the scope of the Convention.[61]

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56 Resolution 7/93, Revision of the International Undertaking on Plant Genetic Resources, Report if the Conference of FAO, 27th Session, November 1993.

57 F. McConnell, *The Biodiversity Convention: A Negotiating History* 32 (Kluwer, The Hague, 1996).

58 Article 1 of The Convention on Biological Diversity, 1760 UNTS 79; 31 ILM 818 (1992) (hereinafter referred to as 'CBD').

59 Article 3 of the CBD provides that, "States have, in accordance with the Charter of the United Nations and the principles of international law, the sovereign right to exploit their own resources pursuant to their own environmental policies, and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction".

60 Article 15(6), (7) of the CBD.

61 Laurence R. Helfer, *Intellectual Property Rights in Plant Varieties – International Legal Regimes and Policy Options for National Governments* 12-13 (FAO Legislative Study 85, for the Development Law Service, FAO Legal Office, Food and Agriculture Organization of the United Nations, Rome, 2004).

It contains numerous provisions intending to protect proprietary claims over PGRs that mediate competing claims of industrialized and developing countries.[62] Article 8(j) of the Convention acknowledges the valuable contribution and active role of local and indigenous communities in conservation and development of biological resources through their traditional lifestyle and farming practices. In 2002 the State parties to the CBD formally adopted the Bonn Guidelines on Access to Genetic Resources and the Fair and Equitable Sharing of the Benefits Arising out of their Utilization (the Bonn Guidelines).[63] The guidelines, which are voluntary in nature,[64] comprise the broadly accepted criterion for the licensing of access to genetic resources in conformity with the rights and obligations of the Contracting parties under the CBD.[65] It serves as inputs for providing legislative, administrative or policy framework relating to access and benefit-sharing arrangements under mutually agreed terms and conditions.[66] Considering the importance of bioprospecting,[67] which involves a broad range of stakeholders the guidelines recommend that all stakeholders should be consulted, and their views must be taken into consideration while taking any legislative, administrative and policy initiatives in this regard. The Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization (Nagoya Protocol) to the Convention on Biological Diversity intends to afford a transparent legal framework for the effective implementation of fair and equitable sharing of benefits arising out of the utilization of genetic resources. It stresses that, the benefits arising out of the utilization of traditional knowledge and resources shall have to be shared in a fair and equitable manner with the country providing the particular resources.[68]

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62 Prof. Laurence R. Helfar, "Regime Shifting: The TRIPS Agreement and New Dynamics of Intellectual Property Law Making" 29 (1) *Yale J. Int'l L.* 28(2004).

63 CBD, *Bonn Guidelines on Access to Genetic Resources and Fair and Equitable Sharing of the Benefits Arising Out of Their Utilization* (Secretariat of the Convention on Biological Diversity, 2002), https://www.cbd.int/doc/publications/cbd-bonn-gdls-en.pdf (last visited January 16, 2013) (Hereinafter referred to as the 'Bonn Guidelines').

64 John Linarelli, "Treaty Governance, Intellectual Property and Biodiversity" 6(1) *Env. L. Review* 30 (2004).

65 Michael I Jeffery Q. C. "Bioprospecting: Access to Genetic Resources and Benefit- Sharing under the Convention on Biodiversity and the Bonn Guidelines" 6 *Sing. J. Int'l & Comp. L.* 747-808 (2002).

66 The Bonn Guidelines, Clause 1.

67 Biodiversity prospecting commonly known as bio-prospecting refers the search and collection of biological materials to be used for commercial purpose. For more details, *see* Darrell A. Posy & Graham Dutfield, *Beyond Intellectual Property: Toward Traditional Resource Rights For Indigenous People and Local Communities* 227 (IDRC, Ottawa, 1996).

68 Nagoya Protocol, Article 5.

In 1994, the FAO initiated negotiations to revise the IUPGR, 1983 to make it a legally binding multilateral treaty comprising the new direction given by the CBD, 1992. The new multilateral agreement, the International Treaty on Plant Genetic Resources for Food and Agriculture (PGRFA Treaty)[69] became the first legally binding agreement exclusively dealing with the management of crop genetic resources. The PGRFA Treaty requires the Contracting Parties to develop and maintain appropriate policy and legal framework that promote sustainable use of PGRs for food and agriculture. In relation to control over PGRs, the PGRFA Treaty simultaneously asserts that states have sovereign rights over their PGRs for food and agriculture and issues related to its sustainable use are the common concern of humankind. The PGRFA Treaty obliges all countries to survey, promote the collection and promote the conservation *in situ* of PGRs for food and agriculture for sustainable use of the same.[70] It suggests for appropriate policies fostering sustainable use, development and maintenance of diverse farming systems that enhance the sustainable use of agro-biodiversity, and the promotion of plant breeding efforts towards the development of varieties adapted to the specific socio-economic and ecological conditions. The farmers' contribution in conserving and enhancing PGRs for food and agriculture has been duly recognized by the member states in the Treaty beyond what had been achieved in the International Undertaking.[71] The Treaty recognised the farmers' rights to save seed, use, exchange and sell farm-saved seed or propagating material which cannot be taken away from farmers. The PGRFA Treaty emphasizes the need to protect traditional knowledge relevant to PGRs for food and agriculture.[72] It directs each Contracting Parties to take measures for protecting and promoting rights of traditional farmers in accordance with their socio-economic objectives, and subject to its national legislation. The Treaty like the CBD makes an attempt to link intellectual property protection and environmental management related issues considering the proprietary claims over PGRs. It also contains the most comprehensive statement that facilitated access is not applicable in relation to the protected PGRs in which case the relevant intellectual property system prevails.[73] While specifically recognizing state sovereignty over genetic resources and condoning the introduction of IPRs in agriculture, the PGRFA Treaty at this level to revert to a logic of open access coming from the philosophy behind the International Undertaking.[74]

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69 The Treaty entered into force on June 29, 2004. As on May, 2016, 140 countries are contracting parties to the Treaty *accessible at* http://www.planttreaty.org/list_of_countries (last visited May 25, 2016) (hereinafter referred to as 'PGFRA Treaty').

70 Article 6, PGRFA Treaty.

71 Philippe Cullet, *Intellectual Property Protection and Sustainable Development* 107-109 (LexisNexis, New Delhi, 2005).

72 Article 9(2), PGRFA Treaty.

73 *Supra* n. 71 at 174-175.

74 WP Falcon and C Fowler, "Carving up the Commons-Emergence of a New International Regime for Germplasm Development and Transfer" 27 *Food Pol'y* 197, 211 (2002).

The Multilateral System (MLS) established under the PGRFA Treaty intends to provide a practical mechanism to address the issues related to conservation and access to PGRs as common concern for humankind.[75] The system facilitates the access to technologies for the conservation, characterization, evaluation and use of PGRs to which the contracting parties agreed upon. Access under the Multilateral System (MLS) will be made through a standard Material Transfer Agreement (MTA) which will be complemented by a benefit sharing regime.[76] In relation to monetary benefits, the recipient who commercializes a product accessed under Multilateral System (MLS) must pay an equitable share of the benefits.[77] The benefits arising out of the benefit sharing regime must be directed primarily to the farmers and people of the indigenous community who conserve and sustainably use the PGRs for food and agriculture. The PGRFA Treaty provides for the three interrelated goals of conservation, sustainable use and benefit sharing,[78] intending to promote sustainable agriculture and food security. The most important contribution of PGRFA Treaty is the recognition of farmers' contribution to conserving and enhancing PGRs for food and agriculture, their contribution to the conservation of agro-biodiversity and to some extent the importance of traditional knowledge. While providing broad guidelines to the states as to the extent of the rights to be protected under this heading, the PGRFA treaty devolves the overall responsibility to frame the legal framework for realizing farmers' rights upon the member states. The PGRFA treaty not only emphasises the need for conservation and sustainable use of PGRs for food and agriculture but also provides direct and indirect links to IPRs instruments by delineating a legal framework for access and benefit sharing in case of commercial exploitation of PGRs.[79]

V Plant Intellectual Property Rights: A Review of Legal and Policy Developments in India

The development of agricultural biotechnology along with intellectual property protection system has given PGRs a new dimension in the present global economy. While accommodating the national interest, the ability to identify and protect creativity in plant breeding is the primary requirement of an effective regime for protection of plant-related innovations under Article 27.3 read with Articles 7 and 8 of the TRIPS

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75 Article 10, PGRFA Treaty.

76 It includes exchange of information, access to and transfer of technology, capacity building and sharing of benefits arising from commercialization, however, it remains silent as to the farmers' rights over their land races.

77 *Supra* n. 75, Article 13(2)(d).

78 *Supra* n. 75, Article 1.

79 Dr. Philippe Cullet & Radhika Kolluru, "Plant Variety Protection And Farmers Rights-Towards A Broader Understanding" 24 *DLR* 46-47 (2002/2003).

Agreement. At the national level, a significant progress has been made to address the issues related to it. The Protection of Plant Varieties and Farmers' Rights (PPV&FR) Act, 2001 is the Indian *sui generis* legislation,[80] directly addresses the issues of protection of plant varieties, and rights of farmers and plant breeders in India.[81] Since protection of plant varieties has a direct nexus with the sustainable use of biodiversity and food security, the country has introduced legislations pertaining to the Convention on Biological Diversity in the form of the Biological Diversity Act, 2002 and also made necessary amendments in the Patents Act 1970. Moreover, the government has placed a new Seeds Bill before the parliament to address the gap in existing seeds regulation considering the technological development in the field of agriculture.

The Patents Act, 1970 dealt with patents in general and was not particularly related to biological resources such as seed and plant. It rejected the patentability of any method of agriculture in a restrictive manner in comparison to similar laws in other developed countries.[82] However, to comply with the TRIPS requirements to protect biotechnological inventions,[83] coupled with the requirement to integrate the domestic intellectual property laws with the international intellectual property regimes, require amendment in the Act.[84] The Patents (Amendment) Act, 2002 deleted the word "plant" from section 3(i), which deals with the scope of patentability. It also incorporated section 3(j), excluding 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 from the scope of patentability under this Act. Keeping in mind the estimated 110 million farming families mainly comprising small and marginal land holders and their appreciable role in conserving and improving the plant material and associated knowledge, India enacted the PPV&FR Act, 2001 that establishes plant breeders' rights and articulates the concept of farmers' rights as well.[85] The introduction of farmer's variety and extant variety

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80 It appears from the preamble of the PPV&FR Act, which provides that, "whereas India, having ratified the Agreement on Trade Related Aspects of Intellectual Property Rights should inter alia, make provision for giving effect to sub-paragraph(b) of paragraph 3 of Article 27 in Part II of the said agreement relating to protection of plant varieties."Protection of Plant Varieties and Farmers' Rights Act, 2001 (hereinafter referred to as 'PPV&FR Act').

81 The Philippines and Thailand also implemented *sui-generis* protection system.

82 Patents Act, 1970, Section 3(h).

83 It covers the process for the creation or modification of living organisms and biological material; the result of such processes; and the use of such results. *See*, WIPO, *Background Reading Material on Intellectual Property* 375 (1988). *See*, WIPO, *Background Reading Material on Intellectual Property* 375 (Geneva, 1988).

84 D.P. Mittal, *Indian Patents Law & Procedure* 27 (Jain Book Agency, New Delhi, 2002).

85 Plant variety protection as form of IPRs has been considered as more appropriate than a utility patent system during the early phases of agricultural development. *See,* Susan Maccouch and Samuel Crowell, "Crop Technologies for coming Decade" in Christopher B. Barrett (ed.), *Food Security & Sociopolitical Stability* 191 (Oxford University Press, UK, 2013).

were made to balance breeders' rights along with the rights of other players in agricultural trade.[86] The government, as being the owner of the extant varieties enjoys the rights to determine their production, sale, marketability, distribution, exportation or importation.[87] This provision intends to protect biodiversity by empowering the government to negotiate with entities that require plant genetic materials for biotechnological innovations.[88] The Act recognizes the farmer not just as a cultivator but also as a conserver of the agricultural gene pool and breeder who has bred several successful varieties. This formulation allows the farmer to sell seed in the way he was always done, with the restriction that this seed cannot be branded with the breeders' registered name. Under the provision of the Act a farmer who took the initiatives in conserving of genetic resources of land races and wild relatives of economic plants, and contributed in their improvement through selection and preservation shall be entitled in the prescribed manner for recognition and reward from the "Gene Fund", provided that material so selected and preserved has been used as raw material for creating the new varieties registrable under this Act.[89] To secure public interest, the Act excludes certain varieties from registration where prevention of commercial exploitation of such variety is necessary to protect public order or public morality or human, animal and plant life and health or to avoid serious prejudice to the environment.[90] This provision of PPV&FR Act, 2001 indicates the importance for sustainable use of various genetic resources present in biodiversity. The PPV&FR Act, 2001 introduces the concept of benefit sharing by the traditional farmers, communities and organizations, recognizing their contribution in development of new variety. This right is closely linked with the concept community IPRs, which confers rights to group or class of people instead of conferring to an individual. Changes in legislation granting intellectual property protection to plants or plant genes are very likely to affect the availability of PGRs in the future. In such situation, the provision which seeks to compensate farmers and local communities through a National Fund to support conservation and use of PGRs constitutes the significant step towards the sustainable use of biodiversity.[91] The Indian legislation provides sufficient incentive

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86 Dr. T. Ramakrishna, "Development of IPR Regime in India with Reference to Agricultural Biotechnology" 21, *available at* http://www.ids.ac.uk/files/Ramakrishna_IPR.pdf (last visited Sep. 12, 2013).

87 PPV&FR Act, 2001, Section 28.

88 Srividhya Ragavan & Jamie Mayer O'Shields, "Has India Addressed Its Farmers' Woes? A Story of Plant Protection Issues" 20 *The Georgetown Int'l Envtl. Law Review* 15 (2007).

89 PPV&FR Act, 2001, Section 39(iii).

90 *Supra* n. 89, Section 29(1).

91 Sanjit Kumar Chakraborty, *Protection of Plant Varieties under the Intellectual Property Right Regime: Farmers' Rights in India*110-111 (2004) (Unpublished LL.M. Dissertation, University of North Bengal).

for the seed industry to invest in this sector by incorporating a well-defined breeder's right.[92]

The Biological Diversity Act, 2002 has been enacted to advance the objectives related to 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 and knowledge.[93] The Act puts severe restriction on the access to biological resources or related knowledge for all foreigners to prevail over the issue of bio-piracy and block the unhindered access to genetic resources.[94] Section 6 of the Act provides that application for IPRs over genetic resources not to be made without approval of National Biodiversity Authority. The National Biodiversity Authority has also been empowered to take appropriate measures to oppose the grant of IPRs in any country outside India on any biological resource or associated knowledge originated from India.[95] In determination of equitable benefit sharing by National Biodiversity Authority (NBA) shall, subject to any regulations made in this behalf, determine the benefit sharing which shall be given according to the manner prescribed by the Act.[96] By the creation of the National Biodiversity Fund, the Act Seeks to channel benefits "to the conservers of biological resources, creators and holder of knowledge". The innovative concept of benefit sharing allows the Authority to grant joint ownership of monopoly rights in the form of IPRs to both the inventor and the Authority or the actual contributors if they can be identified. India is a country with vast ancient pool of traditional knowledge, both coded and informal, which forms its rich agricultural-biodiversity and therefore, is an easy target for accessing valuable traditional knowledge and PGRs. The unregulated access to these impacts the ecosystem and the socio-economic-cultural fabric of the country, which may lead in endangering of genetic resources as well as traditional forms of livelihood practiced by traditional communities since long.[97] Realizing the importance of traditional knowledge and lack of its documentation in international language, a major initiative has been taken by India in early 2001 in terms of developing a Traditional Knowledge Digital Library (TKDL).[98] The recent National

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92 Mark D. Janis, Herbert H. Jervis, and Richard Peet, *Intellectual Property law of Plants* 161-170 (Oxford University Press, UK, 2014).

93 Biological Diversity Act, 2002, Preamble.

94 *Supra* n. 93, Section 3.

95 *Supra* n. 93, Section 18(4).

96 *Supra* n. 93, Section 21(2).

97 Sunita K Sreedharan, "Bridging Time and Tide- Traditional Knowledge in the 21st Century" 146 *JIPR* 15 (2010).

98 For a detail discussion on Protection of Traditional Knowledge through Documentation and the Role of TKDL; Shahid Alikhan and Raghunath Mashelkar, *Intellectual Property and Competitive Strategies in the 21st Century* 83-85 (Aditya Books Pvt. Ltd., New Delhi, First Indian Reprint, 2006).

IPR *Policy suggested for widening the scope of the existing Traditional Knowledge Digital Library (TKDL) by including different intellectual property resources beyond the Indian systems of medicine.*[99] In the year 2014, TKDL has achieved success in preventing the grant of wrong patent in 24 cases without any cost.[100] Seed industry for a long time has been regulated through Seeds Act, 1966, Seeds (Control) Order, 1983 and the New Policy on Seed Development, 1988. To provide an appropriate climate for the seed industry to utilize available and prospective opportunities, safeguarding the interest of farmers and conservation of the biodiversity the National seeds policy was formulated in the year, 2002. Considering the development of plant IPRs the Ministry of Agriculture introduced a Seeds Bill in 2004, to encourage seed trade, to promote the seed industry, boost exports, and protect seed quality by replacing the Seeds Act, 1966.[101] However, owing to severe criticisms the Government of India referred the Bill to the Parliamentary Standing Committee on Agriculture (PSCA), chaired by Ram Gopal Yadav. Though the latest version of the Bill addresses most of the concerns expressed by different stakeholder,[102] there are some areas, which need further attention by the lawmakers. In addition to the issue of seed price regulation, the harmonization of registration procedure between the PPV&FR Act, 2001 and the new Seed Bill need particular analysis to ensure benefit sharing scheme as instituted under the PPV&FR Act, 2001.

VI Conclusion and Suggestions

The above discussion indicates that a major legislative and policy shift has taken place in relation to ownership, control and use of PGRs considering the development of international governance of IPRs and its application over PGRs. Although, the informal seed sector remains the major source of seed supply at the domestic level, biotech seeds with better qualities and desirable traits are gaining wide acceptance among the

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99 Government of India, *National Intellectual Property Rights Policy (2016).*

100 Dr. V.K. Gupta, "Protecting India's Traditional Knowledge" 3 *WIPO Magazine* 12 (2011). Mr. Ananad Sharma, Union Minister for Commerce, and Industry while addressing a high level policy dialogue at WIPO, Geneva on March 8, 2013 informed that, "TKDL intends to give legitimacy to existing Ayurvedic and related traditional knowledge and enable protection of such information from getting patented by the fly-by-nigh in vendors acquiring patents on Indian traditional knowledge. TKDL ensures case of retrieval of traditional knowledge related information by patent examiners and thus ensuring avoidance or misappropriation of Indian traditional knowledge. This will also clearly identify a large number of patents already granted on our traditional knowledge for non original inventions, which may require cancellation. At present this unique library has 250,000 entries specifying the source and the efficacy of each product."

101 K.M. Gopakumar and Sanjeev Saxena, "Seeds Bill 2004: For Whom?" 47(4) *JILI* 483-501 (2005).

102 Harbir singh and Ramesh Chand, "The Seeds Bill, 2011: Some Reflections" XLVI (51) *EPW* 24 (2011).

farmers for agricultural production. Recently NITI Aayog has also strongly advocated for wider use of agricultural biotechnology to revive agriculture growth in the country. The Aayog strongly recommended that, "It is time for us to return to allow massive research into improving seed varieties including genetically modified one."[103] The basic argument to justify proprietary rights over PGRs in the form of plant IPRs is that it provides an incentive to the private sector for their R&D activities in agricultural biotechnology and plant breeding. The experience of developed countries has shown that credible systems of protection of proprietary material enhance appropriability of research benefits and promote private investment for research and development (R&D) in agricultural biotechnology and plant breeding, especially when the public funded research has become ineffective for various reasons. Although the Indian legal system quite resemblance to international agreements, it contains many provisions substantially different from them. A number of provisions and concepts in TRIPS, UPOV, the IUPGR and CBD directly constitute key elements in national legal framework. India exercises the *sui generis* option to balance the interests of commercial plant breeders, farmers, and indigenous people, and recognises plant IPRs to the formal plant breeders on the UPOV model and develops well defined farmers' right that derives from the IUPGR.[104] The private sector has also shown its confidence and interest in the national system by applying for the protection of their plant varieties with the PPV&FR Authority. However, as to the efficacy of the present legal framework, it appears that the existing legal system deals with the plant variety management from the point of view of their commercialization and fails to take into account the fact those commercial activities cannot be separated, either legally or in practice, from conservation of biodiversity and sustainable use of PGRs. In a study commissioned by the US Department of Agriculture it is found that "…incentives for private investments are unlikely to direct large-scale resources toward solving many problems in developing countries."[105]

Since the IPRs has emerged as new actor in the field of agricultural biotechnology care has to be taken not to monopolies the PGRs by allowing discrepancy to standards for making the agro-business companies undue profits. Farmer's rights must be interpreted as to the right of ownership over the PGRs which they have developed and conserve for a long time by their traditional practices.[106] The overall analysis of

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103 Mahendra K. Singh, "Niti Aayog turns a Deaf Ear to RSS Arm, Bats for GM Crop" *The Times of India* (January 12, 2017).

104 Laurence R. Helfer and Graeme W. Austin, *Human Rights and Intellectual Property: Mapping the Global Interface* 410 (Cambridge University Press, New York, 2011).

105 Christopher May, *A Global Political Economy of Intellectual Property Rights- The New Enclosure?* 21 (Routledge, London and New York, 2000).

106 *Supra* n. 30.

the present legal system demonstrates that it does attempt to discipline the IPRs system in some areas, but failed to give the "right people" the right to own, control and use of PGRs as well as the knowledge associated thereto. Though a good attempt has been made to protect local community's rights in broad sense, it requires impact assessments to ensure that all developmental activities are in harmony with biodiversity conservation and sustainable use of PGRs. The provisions are seem to be more or less regulatory in nature and failed to confer any substantive rights to the people who took every initiative to conserve, develop and to make sustainable use of PGRs generation after generation. To give effect of the declared objects of the CBD about the protection of Traditional knowledge of indigenous and local communities associated with biological resources, the laws should be restructured. Though the present legal system confers ownership rights to both farmers and formal breeders, the agro-biotech companies have greater influence while the traditional farmers seem to be far behind in realising their rights upon PGRs. Moreover, very recently Monsanto Co. has filed an appeal before the Supreme Court of India claiming patent protection on its genetically modified (GM) cotton seed, and disputed India's *sui generis* legislation granting intellectual property protection for agricultural products, including seeds.[107] Biological resources and the knowledge associated with them are inseparable which implies that the ownership of biological resources and associated traditional knowledge with the indigenous and local communities must be recognized. In the context of proprietary claims over PGRs, farmer's rights are the equilibrating force to breeders' rights and patents on seed and plant material. There must be equal recognition the readers and farmers' rights simultaneously and the rights of the citizens as producers and consumers need to restored. Plant IPRs should not be employed as an economic tool to promote and protect biotechnology industry from commercial perspective; rather focus should be given to use plant IPRs as an instrument for conservation, use, improvement and sharing of plant genetic material for sustainable utilization facilitating the realization of human rights for all.

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107 The Division Bench of Delhi High Court rejected Monsanto's plea to enforce the patent for its Bt. Technology referring Section 3(j) of the Patents Act, 1970 and ask the company to seek protection under the PPV&FR Act, 2001; *Nuziveedu Seeds Ltd.* v. *Monsanto Technology Llc.,* FAO (OS) (COMM) 86/2017, C.M. APPL.14331, 14335, 15669, 17064/2017 (In The High Court Of Delhi At New Delhi, April 11, 2018).