

Genetically Modified Seeds, Intellectual Property and Agriculture: Has India Addressed the Challenges of Commodifying Plant Genetic Resources and Farmers' Right to Access Seed?

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Abstract

Agriculture plays a vital role in the socio-economic development in India, which remains the primary source of livelihood for about 58% of the total population. The rapid advancement of genetic engineering (GE) for improving agricultural production and quality over the last couple of decades results in the expansion of intellectual property rights (IPRs) for plant varieties, including genetically modified (GM) seeds and plants. Under World Trade Organization (WTO), the global intellectual property regime directs the member countries to extend IPRs over agricultural biotechnology through appropriate legislation considering its socio-economic objectives. However, the commodification of PGRs through technology and law poses serious socio-economic and ecological concerns, more importantly, the farmers' age-old practice of 'selecting-saving-resowing'. Despite enormous criticisms against GM technologies in agriculture, the government's approaches seem to support GM crops. Recently, the NITI Aayog has advocated for the broader use of GM seed varieties to revive agriculture growth. Against this backdrop, the present

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paper aims to study the commodification of seed and analyze the socio-legal issues related to the intellectual property protection of PGRs. There is a broad consensus that vigorous plant IPR has implications upon sustainable use of agrobiodiversity, farmers' right to access seed, rights of indigenous communities, and promote private control over PGRs and agricultural practices. This paper critically analyses the public concerns about GM seed and scrutinizes the changes in the legal framework granting plant IPRs. The paper attempts to evaluate the efficacy of India's legislative and policy measures addressing the farmers' right to access seed in view significant development of agricultural biotechnology and its protection under the global intellectual property regime.

Introduction

Agriculture is an integral part of India's economy and employment generation, primarily predominated by small and marginal farmers. Farmers and rural communities have contributed significantly by creating, conserving, exchanging, and utilizing genetic diversity, providing feedstock to the biotechnological industry. In the traditional farming system, farmers have played a critical role in seed management for whom, as *Jack Kloppenburg* describes it, 'both a means of production and a product'.¹ Agriculture is a 'complex technology system' of various techno-economic institutions in which seeds occupy the pivotal primacy.² Plant Genetic Resources (PGRs)³ such as seeds and plants have always been valuable economic assets and the means of livelihood for many people in India. Traditionally, individual ownership was negated for

¹ JACK KLOPPENBURG, *FIRST THE SEED: THE POLITICAL ECONOMY OF PLANT BIOTECHNOLOGY 1492-2000* xiv (Cambridge University Press, 1988).

² See, 3a Dwijen Rangnekar, *Access to Genetic Resources, Gene-based Inventions and Agriculture* 8 (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.

³ FAO International Code of Conduct for Plant Germplasm Collecting and Transfer, *Article 2* defines plant genetic resources as "the reproductive or vegetative propagating materials of plants".

PGRs and considered as a part of the “common heritage of mankind”⁴ and exchanged freely among themselves.⁵ However, the breakthrough in genetic engineering, globalization of agricultural trade, and availability of intellectual property protection for plant-related innovations raise severe concerns from the farming perspective in India, which is rapidly shifting to biotechnological means.⁶ Recently, in the appraisal document of the 12th Five Year Plan, the NITI Aayog also strongly advocated for broader use of GM seed varieties to revive agriculture growth in the country and appealed that, “It is time for us to return to allow massive research into improving seed varieties, including genetically modified one.”⁷

The expansion of intellectual property rights (IPRs) in agricultural biotechnology, particularly for plant breeding and seed production, raises serious apprehension for its far-reaching implications upon agriculture, food security, environment, traditional knowledge, and, more particularly, farmers’ right to access the seed. Some scholars described the conflict over introducing intellectual property protection of PGRs as “a conflict between farmers and the seed industry and between the public domain and private profits, between agriculture that produces and reproduces diversity and one that consumes variety and produces uniformity”.⁸ Furthermore, the imposition of the intellectual property regime over PGRs ascribes ownership to a private individual or a company, excluding the traditional farmer to whom seed is the

⁴ C.S Srinivasan, *Exploring the Feasibility of Farmers’ Rights* 21 *DEV. POL’Y REV.* 419, 420 (2003).

⁵See, Susan Maccouch and Samuel Crowell, *Crop Technologies for Coming Decade*, in *FOOD SECURITY & SOCIOPOLITICAL STABILITY* 186, 191 (Christopher B. Barrett ed., 2013).

⁶ The Department of Biotechnology, Indian Council of Agricultural Research, Department of Science and Technology, Council for Scientific and Industrial Research actively engages in agricultural biotechnology research.

⁷ See, Mahendra K. Singh, *Niti Aayog turns a deaf ear to RSS arm, bats for GM crop*, *The Times of India*, New Delhi, January 12, 2017, at 6.

⁸ DR. VANDANA SHIVA & KUNWAR JALEES, *SEEDS OF SUICIDE: THE ECOLOGICAL AND HUMAN COST OF SEED MONOPOLIES AND GLOBALISATION OF AGRICULTURE* 30 (Navdanya, 2006).

fundamental and primary input for agricultural production. The Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS Agreement) mandatorily requires the protection of plant varieties either by patents or by an effective *sui generis* system or any combination thereof for effective integration with the global economy.⁹ Doing so led to the dispute regarding the allocation of ownership rights to focus on specific interests but overlooks general welfare.¹⁰

Against this background, the present research aims to study the legal protection of plant varieties under the global intellectual property regime and the effects thereof. The purpose of this research is to make an in-depth analysis of farmers' right to access seed because of the international trend of assigning proprietary rights over seed through its commodification by both technological and legal means. In addition to these, the study critically examines the social, legal, ethical, and ecological aspects to assign a broader perspective to the research topic. Lastly, to deal with the core question of the research about farmers' right to access seed, the paper reevaluates the government policies, enacted laws, international treaties and agreements, research reports, and public inquiries through doctrinal research methodology.

TRIPS Agreement and Indian Agriculture: Examining The Interface

The Agreement on Trade-Related Intellectual Property Rights (TRIPS),¹¹ while emphasizing IPRs as private rights, recognized that intellectual property seeks to foster public policy goals, including developmental and technological objectives.¹² It requires the WTO Member States to provide minimum standards of intellectual property

⁹ TRIPS Agreement, *Article 27.3.(b)* states: "Members shall provide for the protection of plant varieties either by patents or by an effective *sui generis* system or by any combination thereof."

¹⁰ Saksham Chaturvedi and Chanchal Agrawal, *Analysis of Farmer Rights in the Light of Plant Varieties and Farmers' Rights Act in India* 709 EIPR 33(2011).

¹¹ See, *Understanding the WTO: Basics, The Uruguay Round*, WORLD TRADE ORGANIZATION (May 16, 2021, 10:25 AM), https://www.wto.org/english/thewto_e/whatis_e/tif_e/fact5_e.htm

¹² TRIPS Agreement, 1994, *Article 7*.

protection for all fields of technology, such as *inter-alia*, pharmaceuticals, and biotechnology, without any discrimination. States cannot limit patent protection because the disclosed invention belongs to a particular technological domain, including plant varieties.¹³ Therefore, while WTO members may deny patent protection for plants and seeds,¹⁴ it requires the States to provide any one of the three broad forms of protection outlined in Article 27.3. (b) of the TRIPS Agreement.¹⁵ The required protection need not be of international standard or be comparable to the patents granted under the TRIPS Agreement¹⁶, as long as the individual country adopted an effective intellectual property mechanism to protect plant varieties.¹⁷ The countries are at liberty to define the subject matters for exclusion from patentability broad enough to avoid entirely granting patents on living organisms and their genetic parts and components.¹⁸ The intellectual property protection regime depends upon the socio-economic policies of the individual States. Thus, Article 27.3.(b) accommodates national priorities in protecting plant varieties.¹⁹ Countries have considerable latitude and space to be legally imaginative as they implement this obligation, making it ripe for forum-

¹³ TRIPS Agreement, 1994, *Article 27.1*.

¹⁴ CARLOS M. CORREA, SANGEETA SHASHIKANT, ET. AL., PLANT VARIETY PROTECTION IN DEVELOPING COUNTRIES: A TOOL FOR DESIGNING A SUI GENERIS PLANT VARIETY PROTECTION SYSTEM: AN ALTERNATIVE TO UPOV 1991, 16 (APBEBES, 2015).

¹⁵ The effective protection can be made either by patents, or by a *sui-generis* system or a combination of both patents and *sui-generis* system.

¹⁶ See, Biplab Dasgupta, *Intellectual Property Rights: For Safeguards Against Bio-Piracy* 16(21) THE FRONTLINE 88 (1991).

¹⁷ DAVID P. STEWART (ED.), THE GATT URUGUAY ROUND: A NEGOTIATING HISTORY (1986-1992) 64 (Kulwer Law International, 1993).

¹⁸ Laurence R. Helfer describes it "a much needed 'safe space' for governments to harmonise conflicting norms and policies- a space that is lacking in other areas of the TRIPS Agreement." See, LAURENCE R. HELFER, INTELLECTUAL PROPERTY RIGHTS IN PLANT VARIETIES: INTERNATIONAL LEGAL REGIMES AND POLICY OPTIONS FOR NATIONAL GOVERNMENTS, 39, 58 (Food and Agriculture Organization of the United Nations, Rome, 2004).

¹⁹ Michael Halewood, *Indigenous and Local Knowledge in International Law: A Preface to Sui-Generis Intellectual Property Protection* 44 McGill LJ 953 (1999).

shopping for norms that might alleviate some of the adverse implications of introducing intellectual property in plant varieties.²⁰

Plant Breeding and Seed Production in India

Good quality seeds and disease-free planting materials are essential for crop productivity and security.²¹ In the absence of any active policy for agricultural development during the British Colonial Government of India, after independence, the government took the initiative to formulate proper agriculture policies.²² The policies adopted during Green Revolution Period (1965-1980), identified predominantly as the Green Revolution, relied on better seeds, more water via irrigation, and improved fertilizer quality and quality.²³ Though there was no agricultural policy resolution like the industrial policy, initially, the focus on agriculture in the Five Year Plans makes the government's policy very clear. In addition to giving subsidies to the farmers, there was heavy input in the Research and Development (R&D) government sectors.²⁴

The diversification process of the seed industry started with the expansion of the seed market, which further got steam with the implementation of the New Policy on Seed Development in 1988.²⁵ The

²⁰ See, Dwijen Rangnekar, *Geneva Rhetoric, National Reality: The Political Economy of Introducing Plant Breeders' Rights in Kenya*, 19 (3) NEW POLITICAL ECONOMY 360 (2014).

²¹ Government of India, *Serving Farmers and Saving Farming- Towards Faster and More Inclusive Growth of Farmers' Welfare* 20 (Reports of the National Commission on Farmers, Ministry of Agriculture, Govt. of India, 2007).

²² A detailed description of policy followed in each phase and its implications upon the agricultural development in India can be found in V.P.S. Arora, *Agricultural Policies in India: Retrospect and Prospect* 26(2) AERR 135-157 (2013).

²³ See generally, M.L. DANTIWALA, AGRICULTURAL POLICY IN INDIA SINCE INDEPENDENCE, <http://ageconsearch.umn.edu/bitstream/182350/2/IAAE-CONF-051.pdf> (last visited Feb. 12, 2014).

²⁴ See generally, Lawrence Surendra, N.S. Gopala Krishnan, *Intellectual Property, Seeds: The Future of Farmers and Farming* 5 SCC (J) 10-12 (1995).

²⁵ For details, see M. L. Morris, R. P. Singh, *et.al.*, *India's maize seed industry in transition: changing roles for the public and private sectors*, 23 (1) FOOD POLICY 55-71 (1998).

New Policy on Seed Development of 1988 permitting the foreign seed companies or corporations in India also helped this objective.²⁶ The Policy of 1988 was further encouraged by the liberalization of industrial licensing policy leading to the entry of transnational seed companies into the Indian seed sector. It allows import of seed and planting material and tie-up with foreign firms for accessing source seed. The Industrial Policy, 1999 identified seed production as a ‘high priority industry’ and encouraged multinational seed companies to enter the seed business in a restrictive manner.²⁷ The National Agricultural Policy, 2000 emphasized the development, production, and distribution of improved varieties of seeds and planting materials and strengthening and expanding seed and plant certification system with the active participation of the private sector. As inputs management, the policy also encouraged the protection to plant varieties through a *sui generis* legislation to promote research and breeding of new varieties, particularly in the private sector, in line with India’s obligations under the TRIPS Agreement. However, the farmers will be allowed their traditional rights to save, use, exchange, share, and sell their farm-saved seeds except for branded seeds of protected varieties for commercial purposes.²⁸ The parliament met most of these requirements by enacting the Protection for Plant Variety and Farmers’ Rights Act, 2001. To deal with the pressures and opportunities because of the growing expansion of IPRs in agriculture,²⁹ the National Seed Policy, 2002 was released to provide “an appropriate climate for the seed industry to utilize available and prospective opportunities... safeguarding of the interests of Indian farmers and the conservation of

²⁶ See generally, C. E., Pray, B. Ramaswami, *et.al.*, *The impact of economic reforms on R&D by the Indian seed industry* 26(6) FOOD POLICY 587-598 (2001).

²⁷ See, V. R. Gadwal, *The Indian seed industry: Its history, current status and future* 84(3) CS 399 (Feb. 10, 2003).

²⁸ See generally, MOHAN PD. SHRIVASTAVA, NILIMA SAHAY, ET. AL., *SECOND GREEN REVOLUTION VS. RAINBOW REVOLUTION* 287-289 (Deep & Deep Publications Pvt. Ltd., New Delhi, 2010).

²⁹ See, Science and Technology Policy, 2003.

agro-biodiversity.”³⁰ A new Seed Bill, 2004³¹ was drafted and tabled before the parliament to achieve the objectives of the National Seed Policy, 2002 regulating the seed sector in changing legal environment.³² Subsequently, the government has amended the Bill to incorporate the suggestion given by different stakeholders and introduced the revised version of the Bill in the year 2011. The Bill intends to promote private plant breeding in the country, providing Indian farmers multiple choices and increased access to improved seeds. The Bill, along with National Seed Policy, ultimately accepted GM crops.³³

Emerging Role of the Private Sector

Agriculture has developed slowly over thousands of years with the domestication of plants and animals. Historically agricultural research in India has been in the public domain,³⁴ even though there was no bar on the participation of the private sector in plant-breeding activities.³⁵ In the early nineties, the ICAR decided to provide breeder seed of parental lines of public bred hybrids and varieties freely to the private sector. This decision enables private seed companies to grow much faster, even with limited R&D capacity.³⁶ The private seed sector in India started taking part in plant breeding in 1986 and emphasized hybrid seed production. The introduction of the New Seed Development

³⁰ The National Seed Policy, 2002.

³¹ The Bill states that it is to “provide for regulating the quality of seeds for sale, import and export and to facilitate production and supply of seeds of quality and for matters connected therewith or incidental thereto”.

³² The National Seed Policy, 2002 clearly identifies the twin aims of encouraging the seed industry, especially the domestic industry and of ensuring maximum prosperity and security for farmers.

³³ IPRs of the organizations and industries, which have patented such seeds shall be protected under the Plant Variety Protection and Farmers’ Rights Act, 2001.

³⁴ The focus of the research is not only on the profit making, rather it based on the food security of the country.

³⁵ See, Vernon W. Ruttan, *Changing Role of Public and Private Sectors in Agricultural Research* 216(4541) SCIENCE 23 (1982).

³⁶ DR. RAJ S. PARODA, INDIAN SEED SECTOR: THE WAY FORWARD, <http://www.taas.in/documents/pub31.pdf> (last visited Jan. 12, 2016).

Policy (1988–1989) was yet another significant milestone in the Indian Seed Industry, which transformed the very character of the seed industry.

The introduction of the New Policy on Seed Development, 1988, had positive effects on investment by the private sector on Seed and Biotechnology Research, which constitute about 33% of the total amount.³⁷ The policy stimulated appreciable investments by private individuals, Indian Corporate and MNCs in the Indian seed sector with a strong R&D base, emphasizing high-value hybrids of cereals and vegetables and hi-tech products such as Bt. Cotton.³⁸ It results in a wide product choice for the farmers, and the seed industry today is set to work with a farmer-centric approach, and it is market-driven.³⁹ The policy has also resulted in a substantial increase in private investment in the seed sector and increased overall turnover. Despite the concern that introducing IPRs in plant and seed varieties will lead the private companies to focus their research on the areas where they could make a profit,⁴⁰ it also increases access to seeds. In addition, it makes the Indian seed industry more competitive and efficient. The past few years have witnessed a significant worldwide development in broadening the scope of protection offered by the intellectual property system in the plant breeding and seed sector.⁴¹ Over the years, the increased investment made by the private sector has also resulted in better innovations and technology development in agriculture.⁴²

³⁷ *Id.*, at 9.

³⁸ For details, see N Klruthlaka, *Investment and Returns in Indian Agricultural Research: A Theoretical Investigation* 3(1) RRJAAS 26-30 (Jan.-March, 2014).

³⁹ INDIAN SEED SECTOR, <http://seednet.gov.in/material/IndianSeedSector.htm> (last visited March 12, 2021).

⁴⁰ Lawrence Surendra & N. S. Gopalakrishnan, *supra* note 24, at 17.

⁴¹ K R Chopra, *Privatization of the Seed Sector in India* 10(1-2) SAI INFORMATION 13 (1996).

⁴² See, DR. RAJ S. PARODA, *supra* note 36, at 10.

Intellectual Property Protection of GM Seed and Farmers' Right to Access Seed: Evolving Intricacies and Challenges

Modern biotechnology strives to improve yields and quality improvements by using more advanced methods such as recombinant DNA techniques, cell, and tissue culture, cell fusion, and new bioprocessing methods.⁴³ Although this present research aims not to analyze GM seed's success, failure, and ecological sustainability, the following parts elaborate the public concerns about introducing the genetically modified seed and plant to outline suggestions for regulatory mechanisms of agricultural biotechnology in India.

Ecological, Ethical and Social Concerns: An Overview

The Ecological Society of America emphasized that deliberate or accidental releases of genetically engineered organisms (GEOs) into the environment could have negative ecological impacts under some circumstances.⁴⁴ Many critics opposed genetic engineering (GE) because GM crops represent a significant danger to human health and the environment.⁴⁵ For example, pollution by genetically modified pollen may constitute a taking- a legal theory currently being tested in the courts.⁴⁶ In their study, J. R. Pillarisetti and Kylie Radel argued that unnatural gene transfers between entirely unrelated species might create new toxins or 'rough genes' of unpredictable behaviour impacting

⁴³ T. MEREDITH MARIANI, *THE INTERSECTION OF INTERNATIONAL LAW, AGRICULTURAL BIOTECHNOLOGY, AND INFECTIOUS DISEASE 1* (Martinus Nijhoff Publishers, 2007).

⁴⁴ Stephen Bush, *Genetically Modified Organisms in Peasant Farming: Social Impact and Equity* 9(1) IND. J. GLOBAL LEGAL STUD. 135 (Fall, 2001).

⁴⁵ For a detailed analysis as to effect of GMOs and GM crops, see generally Dr. Andre W. Torrance, *Intellectual Property as the Third Dimension of GMO Regulation* XVI(3) KAN. J.L. & PUB. POL'Y 269-273 (2007).

⁴⁶ Sheldon Krimsky, *Ethical Issues Involving the Production, Planting, and Distribution of Genetically Modified Crops*, in *ENGINEERING THE FARM: ETHICAL AND SOCIAL ASPECTS OF AGRICULTURAL BIOTECHNOLOGY* 11, 17-19 (Britt Baily and Marc Lappe, ed. 2002).

health.⁴⁷ The introduction of GM seed is also opposed as it promotes monoculture by reducing crop diversity in the farmers' field.⁴⁸

Another contested issue involving GM crops resting on purely ethical considerations is whether it is morally permissible to alter plants by genetic engineering technology. Their moral justification rests on "natural law" or consequentialist arguments such as the uncertainties that may result from tampering with nature.⁴⁹ The introduction of IPRs over GM seed amounts to the ownership of life, which raises some fundamental ethical questions.⁵⁰ Protecting IPRs in GM seed have a direct impact on the erosion of prior rights of communities. Lack of information, high illiteracy rate, unrelenting poverty deprived the developing countries of having sufficient regulatory mechanisms for developing and enforcing bio-safety protocols for GMOs and making informed decisions about food safety. Many countries are adamantly opposed to the marketing of genetically altered foods as there is no scientific confirmation as to the safety issues of these foods.⁵¹ A primary concern in developing countries is the lack of appropriate mechanisms to recognize and reward traditional farmers having small-scale firms. The conventional farming practices steadily increased the diversity within each species through 'informal innovation' methods such as accidental

⁴⁷ A team of scientists from the Scottish Crop Research Institute stated, "Our results show that significant quantities of pollen travel over large distances; this has implications for transgene recruitment by feral populations, provided pollen viability and competitiveness are unaffected by dispersal." See, A.M. Timmons, Y.M. Charters, J.W. Crawford et al., *Risk from transgenic crops*, 487 NATURE 380 (1996).

⁴⁸ See, J. R. Pillarisetti and Kylie Radel, *Economic and Environmental Issues in International Trade and Production of Genetically Modified Foods and Crops and the WTOI*, 19(2) JEI 334 (June 2004).

⁴⁹ PAUL B. THOMSON, *FOOD BIOTECHNOLOGY IN ETHICAL PERSPECTIVE* 166-167 (Springer, 2nd ed., 2007).

⁵⁰ For example: Can life be owned by individuals or corporations? Do scientists have a right to cross genetic boundaries, introducing transgenes into plants? Are transgenic species ethical constructs? See generally, Vandana Shiva, *Patenting Life Forms: Death for Third World Farmers!*, THE LAWYERS 4-8 (Apr. 1992).

⁵¹ Henrique Freire de Olivera Souza, *Genetically Modifies Plant: A Need for International Regulation* 6 ANN. SURV. INT'L & COMP. L., 2000, at 138.

and intentional cross-breeding and selection.⁵² These indigenous varieties developed by traditional farming are proved environmentally friendly and positively impact ecology. The farmers' have since long been performing the role of the commercial breeder's not through biotechnological methods but traditional and location-specific agricultural practices, and they have tried and tested them as to the effects on ecology.⁵³ While breeders can secure property rights over the varieties they create, the traditional farmers remain deprived of being recognized for their contribution to the new plant variety.⁵⁴

Development of Farmers' Rights: Nature and Scope

In the field of agriculture and food, "farmer's rights" are the countervailing force to breeders' rights and patents on seed and plant material.⁵⁵ One common feature of IPRs and farmers' rights lies in the argument from the viewpoint of equity. It was developed partly in reaction to the introduction of IPRs in agriculture⁵⁶ and devised mainly on the idea that farmers also contribute to modern plant-related innovations for which they must be recognized and rewarded just like the commercial breeders.⁵⁷ The farmer's movement in India had been resisting the introduction of IPRs over PGRs for their far-reaching

⁵² See, THE CRUCIBLE GROUP, PEOPLE, PLANTS AND PATENTS- THE IMPACT OF INTELLECTUAL PROPERTY ON BIODIVERSITY, CONSERVATION, TRADE, AND RURAL SOCIETY 23 (International Development Research Centre, 1994).

⁵³ See generally, David J. Jefferson, Alex B. Camacho, *et.al.*, *Towards a Balanced Regime of Intellectual Property Rights for Agricultural Innovations* 19 JIPR 395-403 (Nov. 2014).

⁵⁴ PAUL B. THOMSON, *supra* note 49, at 163.

⁵⁵ See, Kirit K. Patel, *Farmers' Rights Over Plant Genetic Resources in the South: Challenges and Opportunities*, in INTELLECTUAL PROPERTY RIGHTS IN AGRICULTURAL BIOTECHNOLOGY 96 (Frederic H. Erbisich and Karim M. Mareid eds., 2004).

⁵⁶ See, PHILIPPE CULLET, INTELLECTUAL PROPERTY PROTECTION AND SUSTAINABLE DEVELOPMENT 236, 238 (LexisNexis, 2005).

⁵⁷ See generally, Saksham Caturvedi and Chanchal Agarwal, *Analysis of farmer rights in the light of Plant Varieties and Farmers' Rights Act in India* 33(11) EIPR 709-710 (2011).

implications.⁵⁸ Therefore, the development of robust and effective farmers' rights is increasing importance, allowing them to defend their interest against fraudulent appropriation and benefit from their knowledge in a legal and commercial sense if they so wish.⁵⁹ While the commercialization of food crops may be necessary to all actors engaged in agricultural management, it is by far not the only relevant consideration. The issues like conservation and sustainable use of agrobiodiversity and food security are much more central and essential issues than commercial considerations.⁶⁰

For farmers, the right to seed is a positive right and the fundamental one. The farmers started to assert their right to seed through Community intellectual Rights (CIRS). The first public demonstration of the positive assertion of farmer's rights took place on Independence Day, August 15, 1993, when farmers declared that a *Samuhik Gyan Sanad* protects their knowledge and biodiversity. Thus, it has been seen, with time, the idea of farmer's rights as 'community rights'⁶¹ slowly but gradually developed in India, without which the nation cannot assert the sovereign rights to their agrobiodiversity.

Farmers' Rights to Access Seed and Plant

⁵⁸ See Vandana Shiva, *Agricultural Biodiversity, Intellectual Property Rights and Farmers' Rights* XXXI (25) EPW 1626 (1996); Navdanya, SEED SATYAGRAHA (CIVIL DISOBEDIENCE TO END SEED SLAVERY)- SEED FREEDOM AND FOOD FREEDOM, <http://navdanya.org/news/521-seed-satyagraha> (last visited Feb. 17, 2014).

⁵⁹ According to Carlos M. Correa, "[t]he development of the concept of farmers' rights may be regarded, in this connection, as result of equity considerations: there is a moral obligation to ensure that traditional farmers receive a fair share of the benefits arising from the use of plant genetic resources that they conserve and improve." See, Carlos M. Correa, *Options for the Implementation of Farmers' Rights at the National Level* 11 (South Centre: Working Papers 8, 2000).

⁶⁰ Dr. Philippe Cullet & Radhika Kolluru, *Plant Variety Protection And Farmers Rights-Towards A Broader Understanding* 24 DLR 55 (2002/2003).

⁶¹ See, Stephen Gudeman, *Sketches, Qualms, and Other Thoughts on Intellectual Property*, in VALUING LOCAL KNOWLEDGE: INDIGENOUS PEOPLE AND INTELLECTUAL PROPERTY RIGHTS 103 (S.B. Brush and D. Stabinsky, eds., 1996).

The agribusiness domination of the global seed market and aggressive campaigns to promote protected GM seed and plant challenges the rights of farmers and the traditional farming practices such as seed saving and seed sharing.⁶² Seed buyers purchase not only the product (seed) but also the means of production.⁶³ Since natural seeds reproduce themselves indefinitely, farmers do not buy seeds each year.⁶⁴ The introduction of GM seed protected through different intellectual property mechanisms has altered the farming practice structure,⁶⁵ and farmers became mere consumers from developers.⁶⁶ Farmers worry about increased dependence on novel technologies and corporate monopoly of seed, controlled by external actors based on business strategies.⁶⁷ Such monopoly power may allow the corporate breeders or transnational corporations (TNCs) to manipulate the seed prices.⁶⁸ In addition to that, after seed, farmers are to purchase fertilizers and pesticides as

⁶² See, Haley Stein, *Intellectual Property and Genetically Modified Seeds: The United States, Trade, and the Developing World* 3(2) NW. J. TECH. & INTELL. PROP. 161 (2005).

⁶³ See, S. BALA RAVI, *MANUAL ON FARMERS' RIGHTS* 20 (M.S. Swaminathan Research Foundation, 2004).

⁶⁴ Keith Aoki, *Weeds, Seeds & Deeds: Recent Skirmishes in the Seed Wars* 11(2) CARDOZO J. INT'L & COMP. L. 261, 263 (2003).

⁶⁵ Peter J. Goss, *Guiding the Hand That Feeds: Towards Socially Optimal Appropriability in Agricultural Biotechnology Innovation* 84(5) CALIFORNIA LAW REVIEW 1402 (1996).

⁶⁶ Meghan Marrinan Feliciano, *We Are What We Eat: Securing Our Food Supply by Amending Intellectual Property Rights for Plant Genetic Resources* 8(3) U. ST. THOMAS L.J. 561, 562 (2011).

⁶⁷ Transnational corporations (TNCs) engaged in agricultural business acquired over more than 630 small seed business throughout the world between 1985-1990, to have access to the seed markets and patent on more seeds.

⁶⁸ RAJSHREE CHANDRA, *KNOWLEDGE AS PROPERTY: ISSUES IN THE MORAL GROUNDING OF INTELLECTUAL PROPERTY RIGHTS* 264-265 (Oxford University Press, 2010).

compulsory inputs for growing those seeds.⁶⁹ These push poor farmers into debt-trap leading them to commit suicide.⁷⁰

For farmers, the right to access seed is directly linked with their right to livelihood and subsistence.⁷¹ The farmers from third-world countries vehemently opposed the idea of monopoly rights over seed and plant through IPRs.⁷² This opposition, primarily based on indigenous agro-ecological ethics that prohibits the privatization of community-owned knowledge in agriculture.⁷³ A commercial breeder developed seed varieties to control the present and future resources⁷⁴ and all his initiatives to create new plant varieties based on business strategies. In comparison, the farmers' right to access seed and plant is of prime importance for their livelihood and the wide diffusion of crops and crop varieties through traditional seed systems.

The Commodification of PGRs and Farmers' Rights: Analyzing the Legislative Measures Responding to the Issues and Controversies

After a long and arduous struggle, India uses the *sui generis* option to construct legislation recognizing farmers' rights keeping in mind the estimated 110 million farming families and their appreciable role in conserving and improving the plant material and associated

⁶⁹ See generally, Chidi Oguamanam, *Agro-biodiversity and Food Security: Biotechnology and Traditional Agricultural Practices at the Periphery of International Intellectual Property Regime Complex* 2007(215) MICH. ST. L. REV. 235, 236 (2007).

⁷⁰ See, S. Nages kumar, *The Killing Fields* 15(03) FRONTLINE, Feb. 7-20, 1998, at 16; P. Sainath, *Farm Suicide in India: The Result of Profit Driven 'Free Market' Reforms*, THE HINDU, April 7, 2017, at 5.

⁷¹ Chidi Oguamanam, *supra* note 69, at 235.

⁷² See, David Kemker, *Earthkeeper Hero: Dr. Vandana Shiva* MYHERO, Oct. 11, 2009, at 6, <https://myhero.com/vandana-shiva> (last visited June 17, 2021)

⁷³ See generally, M. Smale, M. R. Bellon, *et.al.*, *Economic concepts for designing policies to conserve crop genetic resources on farms* 51 GENET. RESOUR. CROP EVOL. 121-135 (2004).

⁷⁴ RAJSHREE CHANDRA, *supra* note 68, at 263.

knowledge.⁷⁵ The Protection of Plant Varieties and Farmers' Rights (PPV&FR) Act, 2001 was passed by both House of the parliament in August 2001 to recognize the farmers' rights.⁷⁶ While accommodating the national interest, the ability to identify and protect creativity in plant breeding is the primary requirement of an effective regime for the protection of plant-related innovations under Article 27.3, read with Articles 7 and 8 of the TRIPS Agreement.⁷⁷ The PPV&FR Act, 2001 directly addresses plant variety protection, farmers' rights, and plant breeders' rights in India.⁷⁸ Although the Indian legislation conforms quite closely to international agreements, in other ways, it departs substantially from them. The following section of the paper comprehensively analyses India's legal and policy developments addressing the challenges of commodifying plant genetic resources and farmers' right to access the seed.

Intellectual Property Law of Plant and Farmers' Rights in India

The introduction of farmer's rights is one of the principal aims of the PPV&FR Act, 2001, which envisages that farmers should be treated like commercial breeders and should receive the same protection for the varieties they develop.⁷⁹ The Act recognizes the farmer as a cultivator and a conserver of the agricultural gene pool and breeder who has bred several successful varieties.⁸⁰ Section 39(iv) of the PPV&FR Act, 2001, allows the farmer to sell seed in the way they always practised, restricting

⁷⁵ 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, *supra* note 5, at 191.

⁷⁶ Interestingly the first draft was ready in 1993 two years ahead of the WTO coming into existence. *See*, Vandana Shiva, *Agricultural Biodiversity, Intellectual Property Rights and Farmers' Rights* XXXI (25) EPW 1621(1996).

⁷⁷ For the arguments against the mandate of the TRIPS Agreement, *See*, Vandana Shiva, *Environmental Impact of Economic Globalisation*, in MANAROMA YEAR BOOK 1996, 99 (K. K. Mathew *et.al.* eds., 1996).

⁷⁸ The Philippines and Thailand also implemented *sui-generis* protection system.

⁷⁹ Dr. Philippe Cullet & Radhika Kolluru, *supra* note 60, at 48.

⁸⁰ Section 2(c) of the PPV&FR Act, 2001 defines the term "breeder", which includes a farmer or group of farmers who has bred, evolved or developed any variety.

that this seed cannot be branded with the breeders' registered name.⁸¹ In the absence of the traditional right of seed saving, the farmer will have to pay a royalty for each sowing as he can neither multiple nor use them in the following seasons.⁸² The law provides registration of farmer's varieties with the help of NGOs so that they can be protected against being scavenged by formal breeders. However, fulfilling the technical requirements seems to be problematic for the farmers to get their varieties registered. Farmers' innovations usually occur in fields through informal breeding methods without applying any scientific technology after repeated trials and errors over a long period. Hence, it is almost impossible to observe such criteria for the generally illiterate and poor farmers. A recent study shows that over 600 farmer's varieties have been registered under the PPV&FR Act, 2001, but not a single variety has been introduced in the official seed supply chain.⁸³

The definition of extant variety also includes farmer's variety. However, there are no specific provisions as to the criteria for registration of farmer's variety. In the absence of any particular provision, it appears that a farmer's variety can be registered either as an extant variety or as a new variety. If it is treated as a new variety, it would be impossible for farmers to claim his right. Since there is no exclusion of farmers' varieties and extant varieties, it appears that the Act has failed to distinguish between new varieties, farmers' varieties, and extant varieties. A farmer engaged in the conservation of genetic resources of landraces and wild relatives of economic plants and their improvement shall be entitled to recognition and reward from the 'Gene Fund'.⁸⁴ In an application for registration of any variety, explicit and detailed disclosure

⁸¹ See, Saksham Caturvedi and Chanchal Agarwal, *supra* note 57, at 713.

⁸² See generally, JONATHAN CURCI, *THE PROTECTION OF BIODIVERSITY AND TRADITIONAL KNOWLEDGE IN INTERNATIONAL LAW OF INTELLECTUAL PROPERTY* 5, 6 (Cambridge University Press, 1st edn. 2010).

⁸³ See, Shalini Bhutani, *Intellectual Property Rights Policy Fails to Address Farmers' Rights and Needs* THE WIRE (May 30, 2016), <https://thewire.in/39353/intellectual-property-rights-policy-fails-to-address-farmers-rights-and-needs/> (last visited June 7, 2016).

⁸⁴ PPV&FR Act, 2001, Section 39(iii).

must be made regarding the use of genetic material conserved by any tribal or rural families in the breeding or development of such variety. In case of willful failure to disclose any information, the Registrar may reject the application for registration.⁸⁵ It also provides compensation for the farmers if poor quality spurious seeds led to crop failure.⁸⁶ This provision intends to protect the vulnerability of small Indian farmers, especially to the risks of producing cash crops for export purposes.⁸⁷

Farmers' entitlement to compensation depends upon determining whether the breeder has made spurious claims by the statutory authority established under the PPV&FR Act, 2001.⁸⁸ This provision forces breeders to conform to minimum quality specifications and reduces the tendencies of corporate seed breeders to over advertising about the seed quality.⁸⁹ However, it has been considerably displeased the industry as being burdensome and criticized by scholars for vesting the statutory authority's unlimited discretion.⁹⁰ Another vital right guaranteed under this Act is the protection against innocent infringement.⁹¹ It seems to be a proper step to address a concern voiced by several quarters, that when the new system of Plant Breeder's Rights (PBRs) is introduced, there will

⁸⁵ *Id.*, Section 40

⁸⁶ *Id.*, Section 39(2).

⁸⁷ See, Dr. T. Ramakrishna, *Development of IPR Regime in India with Reference to Agricultural Biotechnology* 22 (NLSIU, 2002), http://www.ids.ac.uk/files/Ramakrishna_IPR.pdf (last visited September 12, 2019), citing Ranja Sengupta, *A Betrayal of Trust: India sets out to join UPOV*, KISANWATCH, June 14, 2002.

⁸⁸ PPV&FR Act, 2001, Section 39(2).

⁸⁹ See generally, 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 120, 121 (2007).

⁹⁰ See, Dr. Suman Sahai, *India's Plant Variety Protection and Farmer's Rights Act, 2001*, 84(3) CS 410 (2003).

⁹¹ There have been instances where non-GM farmers have suffered loss due to unwanted contamination of their crops. For a detailed scientific study on this, see generally, Price, B., Cotter, J. *The GM Contamination Register: a review of recorded contamination incidents associated with genetically modified organisms (GMOs), 1997–2013* INTERNATIONAL JOURNAL OF FOOD CONTAMINATION 1, 5 (2014), <https://doi.org/10.1186/s40550-014-0005-8> (last visited June 16, 2021).

probably be many cases of unknowing infringement of breeders' rights.⁹² Under this Act, the farmer cannot be prosecuted for breach of rights specified in the Act if he can prove in court that he was unaware of the existence of such rights.⁹³

From 'Farmers' Privilege' To 'Farmers' Rights': A Review Of Indian Legal Regime

The PPV&FR Act, 2001 is the first legislation to grant legal rights to the farmers and recognizes the contribution of the local communities in the development of a plant variety. The recognition of farmer's rights is the particular provision of the Indian legislation, which does not find any place in the norms set by UPOV.⁹⁴ While the TRIPS Agreement makes no mention of the necessity to protect farmers' rights, the PGRFA Treaty puts the onus explicitly on member states to make farmers' rights a reality. In such a situation, Indian legislation is an excellent attempt to secure farmers' rights, though there are some complications in implementation.⁹⁵ The most controversial issue that arises due to the introduction of IPR in PGRs is the question of farmers' rights or the farmers' rights over their traditional varieties. The factual basis of farmers' rights recognizes the collective innovation by farming communities in farmers' varieties and evolving a jurisprudence that protects and rewards these collective innovations. A study commissioned by the US Department of Agriculture found that ".....incentives for private investments are unlikely to direct large-scale resources toward

⁹² Dr. Suman Sahai, *supra* note 90, at 409.

⁹³ PPV&FR Act, 2001, *Section 42*

⁹⁴ However, the experience of large public sector research institutes, including the University of California tends to support the implementation of UPOV-compliant framework for the protection of agricultural intellectual property. *See*, Jefferson, David J., Camacho, *et.al.*, *Towards a Balanced Regime of Intellectual Property Rights for Agricultural Innovations* 19 JIPR 401(Nov., 2014).

⁹⁵ For details, *see generally* P. Venkatesh, V. Sangeetha, and Suresh Pal, *India's Experience of Plant Variety Protection: Trends, Determinants and Impact* (Selected Paper prepared for presentation at the 2015 AAEA & WAEA Joint Annual Meeting, San Francisco, California, July 26-28, 2015), <http://ageconsearch.umn.edu/bitstream/200413/2/P%20Venkatesh-paper.pdf> (last visited Jan., 17, 2016).

solving many problems in developing countries.”⁹⁶ Therefore, farmers’ rights must be recognized as collective and community rights over their varieties developed by traditional practices.

Since the IPRs have emerged as new actors in agricultural biotechnology, care has to be taken not to monopolize the PGRs by allowing discrepancies to standards for making the agro-business companies undue profits. IPRs in agriculture transform the nature of agriculture, making it a means for capital. The development of farmers’ rights provides an opportunity to re-examine the entire issue of patents and breeders’ rights.⁹⁷ Farmer’s rights must be interpreted as the right of ownership over the PGRs they have developed and conserve for a long time.⁹⁸ The administrative set up under the PPV&FR Act, 2001 must be closest to the farmer to avail plant variety protection for their developed varieties. Although the Plant Variety Act has a provision of Researchers’ Rights allowing scientists and breeders to have free access to registered varieties for research, it grants very restricted rights to them because of the acknowledgement of EDV. It may restrict the scope of the researcher’s work to develop a new plant variety if all kinds of research require the breeders’ authorization. This provision needs to be changed to ensure that new varieties repeatedly come into the market without hindrance. The analysis of the Biological Diversity Act shows that it does attempt to discipline the IPRs system in some areas but failed to give the ‘right people’ the right over both the biological resources and the knowledge associated with it. The Act reasonably attempts to protect the local community’s rights in a broad sense. It requires impact assessments to ensure that all developmental activities are in harmony with biodiversity conservation and sustainable use. However, to avail the benefits of GM technology in agriculture, issues like persisting rural illiteracy, social marginalization, landlessness, and caste and gender

⁹⁶ Cited in CHRISTOPHER MAY, A GLOBAL POLITICAL ECONOMY OF INTELLECTUAL PROPERTY RIGHTS- THE NEW ENCLOSURE? 21 (Routledge, 2000).

⁹⁷ RAJSHREE CHANDRA, *supra* note 68, at 279.

⁹⁸ See, 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. 292 (2006).

discrimination need to dealt with appropriately.⁹⁹ Therefore, the national legislation should develop in such a way, extending the circle of potential holders of IPRs and making such rights available to local communities. The idea is to foster intellectual property laws that recognize the more informal, communal system of innovation used by the farmers and indigenous communities.¹⁰⁰ The provisions relating to ‘benefit sharing’, ‘rights of researchers’, ‘protection of public interest’ are of considerable importance. Now it is time to take appropriate steps both by the Government and NGOs to make people of the country aware of the existing legal framework and regulatory mechanisms.

Concluding Remarks

The challenges posed by new technologies and IPRs have given new meaning to the concept of property and the governance of the state.¹⁰¹ Under the global intellectual property regime and the privatization of agriculture, intellectual property protection for plant varieties, including GM seed, is the prerequisite. The legal recognition of farmers’ rights is of great importance as it responds to some of the broader challenges associated with introducing IPRs in agriculture. First, farmers’ rights intrinsically identified a link between innovation, rights over knowledge, biodiversity conservation, and the sustainable use of agrobiodiversity.¹⁰² The formal IPRs systems appear to be inherently incapable of protecting local people’s IPRs. Hence, a *sui generis* system incorporating a well-developed community right seems to be a better

⁹⁹ See, ROBERT PAARLBERG, THE POLITICS OF PRECAUTION: GENETICALLY MODIFIED CROPS IN DEVELOPING COUNTRIES 97 (IFPRI, 2001).

¹⁰⁰ See generally, Olivier De Schutter, U.N. Special Rapporteur on the Right to Food, Address at High-Level Conference on World Food Security: *The Challenges of Climate Change and Bioenergy* (June 3-5, 2008), presented to the Human Rights Council on 6 June 2008, <http://www.srfood.org/images/stories/pdf/otherdocuments/3-srrtfreportromehlc-6-6-08.pdf> (last visited Sept. 18, 2019).

¹⁰¹ See, David Zilberman and Leslie Lipper, *Major Process Shaping the Evolution of Agriculture, Biotechnology, and Biodiversity*, in, AGRICULTURAL BIODIVERSITY AND BIOTECHNOLOGY IN ECONOMIC DEVELOPMENT 17, 19 (JOSEPH COOPER, LESLIE LIPPER, ET. AL. EDS., 1992).

¹⁰² See generally, PHILIPPE CULLET, *supra* note 56, at 242, 243.

option. Second, farmers' rights are a necessary component for conserving agrobiodiversity *in situ*. Third, traditional farmers play the roles of breeders of new varieties and enrich biodiversity to a great extent, even though their breeding objectives and methods differ from the objectives and methods of the seed industry. Finally, creating new plant varieties and their use for agricultural production is a matter of great public interest.

Agriculture in India has been traced back to the *Rigvedic* times,¹⁰³ which has become a way of life for centuries and has shaped the thought, outlook, culture, and economic life of the people in India.¹⁰⁴ Agricultural biotechnology and intellectual property protection systems have given plant genetic resources (PGRs) a new dimension in the present global economy.¹⁰⁵ The last few decades have recognized more unique forms of intellectual property such as a *sui generis* system for plant varieties, patent protection for biological materials, plants and animals, etc. Private investment will not occur if there is no effective measure to prevent the misappropriation of PBRs.¹⁰⁶ However, apprehension is that public sector plant breeders in developing countries may find it challenging to deliver seeds to their farmers if the technologies are in the hands of few global

¹⁰³ See, Om Praksh, *Agarian System in Ancient India: Harappan and Vedic*, in HISTORY OF AGRICULTURE IN INDIA (UPTO C. 1200AD) 258 (Lilanjil Gopal and V.C. Srivastave, eds. 2008).

¹⁰⁴ At time of independence in 1947, agriculture and allied sectors provided all over 70% of the country's employment and more than 50% of the GDP which has fallen to 65% and 17.4% respectively. See generally <https://www.cia.gov/library/publications/the-world-factbook/fields/2012.html> and http://censusindia.gov.in/Census_And_You/economic_activity.aspx. (last visited Aug. 18, 2014).

¹⁰⁵ In the first International Agrobiodiversity Congress on November 6, 2016 at New Delhi the Prime Minister of India while emphasising the importance of research in agrobiodiversity to ensure food and nutritional security, remarked, "technology plays an important role in the development of agriculture, but there is a need to monitor the drawbacks of excessive use of technology as well." Prime Minister Narendra Modi emphasized that, "we need to be alert and monitor the technological impact in agriculture". See, ANI, *Research in agro-biodiversity important to ensure food security: PM Modi*, <http://www.aninews.in/newsdetail-MTA/Mjg2MTgx/research-in-agrobiodiversity-important-to-ensure-food-security-pm-modi.html> (last visited Nov. 7, 2016).

¹⁰⁶ In plant variety management PBRs refers to a legal mechanism to maintain trade secrets for a limited period to enjoy the benefits by the breeder or company.

private sector market players. Therefore, the provisions concerning research exemptions under the PPV&FR Act, 2001 should be re-examined to broadening the researcher's rights by giving access to germplasm for crop development, including repeated use of parental line of the protected variety.

In general, the above study confirms that a legal regime granting intellectual property protection of plant-related innovations should not stop at what is commercially helpful today. It should incorporate human rights considerations linked to food security, farmers' rights, protection of traditional knowledge, etc. Considering the interdependent nature of the current global agricultural system, it appears that the concept of farmer's rights is still weak, and single national legislation on farmer's rights or community rights would be inadequate. India and other developing countries could use the negotiations to establish an international concept of farmer's rights and strengthen its legislation by coordinating its efforts with other countries. The analysis of human rights obligations as imposed by international legal instruments revealed that a balanced approach should adhere to the development of plant IPRs with all stakeholders involved in plant variety management.¹⁰⁷

¹⁰⁷ The Commission on Human Rights has stated, "effective popular participation is an essential component of successful and lasting development..... the human person is the central subject of development policy and that development policy should therefore make human being the main participant and beneficiary of development." See, Commission on Human Rights, Resolution 1998/71: *Right to Development* (U.N. Doc. E/CN.4/1998/72, 1998).