E-JAIRIPA
Vol. VII (Issue I), pp.- 19-37

FARMERS AS AGENTS OF SUSTAINABLE DEVELOPMENT: REASSESSING SEED REGULATIONS AND TRIPS FLEXIBILITIES IN INDIA

Authors: *Devika Ramachandran*[1] *& Dr. Amrendra Kumar*[2]

Abstract

The intersection of intellectual property law and sustainable development has recently increased the interests of academicians, scientists and policy makers especially for the regulation of seeds and plant varieties. In developing countries, the ability to use, exchange, save, and sell seeds are essential to economic survival and ecological sustainability. In this regard, one of "World Trade Organization's Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS)" requires its member nations to provide legal protection to plant varieties and seeds by either patenting plant varieties or establishing a "sui generis" system. Being party to this agreement, India as developing countries, enacted its own special intellectual property (IP) legislation for the regulation of seeds and plant varieties with exclusive rights to breeders and farmers. The exclusive rights and flexibilities provided under IP regime over seeds and plant varieties, however, can increase reliance upon the commercial seed markets, raise production costs, and weaken informal seed systems. As a result of these rights and flexibilities provided in TRIPS, the targets of SDG 1 (No Poverty), SDG 2 (Zero Hunger) and SDG 12 (Responsible Consumption and Production) could be impacted as damage inflicted upon rural economies of India.

Against this backdrop, authors aim to examine the contributions of the farmers as agent, for food security and sustainable development. They propose for the inquiry that

[1] Ph.D. Scholar, Faculty of Law, University of Delhi, Delhi.
[2] Assistant Professor (Sr. Scale),Law Centre-II, University of Delhi, Delhi.

farmers are critical agents of sustainable development; and their transformative nature of ability and traditional rights are being compromised through TRIPS obligations and flexibilities while regulating the seeds and plant varieties in India. Besides introduction and conclusion, the central parts of the article include the analysis on seeds and plant varieties in India; international and national IP framework related to it; contributions of the Indian farmers as agent in advancement of SDGs. This article employs doctrinal research method by analytical and descriptive approach to arrive on viable observations and conclusions.

Keywords: Seed and Plant Varieties Intellectual Property Rights, TRIPS Flexibilities, Sustainable Agriculture, Sustainable Development Goals (SDGs).

I. Introduction

The legal aspects of intellectual property and sustainable development are inherently interwoven especially for seeds which is foundation of human food and survival. Seeds represent more than agricultural products stored in packets or traded in markets.[3] For millions of farmers, particularly in developing countries, seeds carry memory, adaptation, and survival strategies refined across generations.[4] They ensure food availability for households, protect livelihoods in uncertain climatic conditions, and preserve the biological diversity that sustains ecosystems. When farmers select and conserve seeds, they do not simply cultivate crops; they sustain life systems on the planet.[5] They save seeds from one harvest, exchange them within communities, and adapt them to local soil and climate conditions.[6] The legal protection for plant varieties and seeds provided at the international and national level is widely depended on "the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) under the World Trade Organization."[7] It allows countries to choose between "patent

[3] Jack Kloppenburg, *First the Seed: The Political Economy of Plant Biotechnology,* 4-7 (University of Wisconsin Press, Madison,2nd edn., 2004).
[4] Vandana Shiva, *The Violence of the Green Revolution: Third World Agriculture and Politics,* 63-64. (Zed Books, London, 1991).
[5] Cary Fowler and Pat Mooney, *Shattering: Food, Politics and the Loss of Genetic Diversity,* 19-42 (University of Arizona Press,1990).
[6] FAO, "Coping with Climate Change: The Roles of Genetic Resources for Food and Agriculture" pp. 2, (Food and Agricultural Organizations of United Nations, Rome, 2015), *available at:* https://www.fao.org/4/am947e/am947e00.pdf (last visited on May 11, 2026).
[7] WTO, Agreement on Trade-Related Aspects of Intellectual Property Rights, April 15, 1994; Marrakesh Agreement Establishing the World Trade Organization, Annex 1C, 1869 U.N.T.S. 299, 33 I.L.M. 1197

protection and an effective *sui generis* system."[8] Yet even this flexibility operates within a broader structure that prioritizes proprietary protection and commercial innovation.[9] In India, these obligations have been complied with special legislation titled as "Protection of Plant Varieties and Farmers' Rights Act, 2001."[10] This legislation acknowledges the "farmers as cultivators, conservers, and, in certain cases, breeders."[11] In doing so, India positioned itself as a country trying to harmonize trade law with social justice.[12]

However, the expansion of exclusive rights over seeds has not remained neutral in its impact.[13] When companies obtain proprietary control over plant varieties, farmers increasingly turn toward commercial seed markets instead of relying on traditional seed-saving practices.[14] Now, access to seeds becomes more commercialized and less community-driven, the broader goals of poverty alleviation and food security face new pressures. In this context, the implementation of TRIPS regime further supports the "Sustainable Development Goal 1 (No Poverty)" and "Sustainable Development Goal 2 (Zero Hunger), "Sustainable Development Goal 12 (Responsible Consumption and Production)", "Sustainable Development Goal 13 (Climate Action)", and "Sustainable Development Goal 15 (Life on Land)." However, this TRIPS agreement contains certain flexibilities that allow states to design plant variety protection systems consistent with their own development priorities. Accordingly, India is also trying to achieve these goals by integrating farmers' right and community practices in compliance with TRIPS obligation and flexibilities provide in its domestic jurisdiction.

Against this backdrop, this article aims to examine the contributions of the farmers in food security and fight against hunger under the preview of 2030 Agenda of Sustainable

(1994). It is divided into 7 Parts and contains 73 articles.

[8] *Ibid,* art.23(b).

[9] Jayashree Watal, *"Intellectual Property Rights in the WTO and Developing Countries"* pp.3-6 (Kluwer Law International, The Hague, 2001)

[10] Rashmi Venkatesan, "TRIPS and Plant Variety Protection in India: Complicating the Globalization Debate", 9 *The Indian Journal of International Economic Law*, 44-61(2018).

[11] Sujith Koonan, "Farmers' Rights in India: Assessing Conceptual and Implementation Issues", 4 *Dehradun L. Rev*. 29,41 (2012).

[12] Biswajit Dhar and Sachin Chaturvedi, "Introducing Plant Breeders' Rights in India: A Critical Evaluation of the Proposed Legislation, 1(2) *Journal of World Intellectual Property* 245 (1998).

[13] Suman Sahai, "Plant Variety Protection and Farmers Rights Law", 36 *Economic & Political Weekly,* 3338 (2001).

[14] C. N. Niranjan Rao, "Indian Seed System and Plant Variety Protection", 39 *Economic & Political Weekly,* 845, 848 (2004).

Development. It proposed that farmers are critical agents of sustainable development; and their transformative nature of ability and traditional rights are being compromised through TRIPS obligations and flexibilities while regulating the seeds and plant varieties in India. This article argues that IP protection regime does not exist as an end in itself; rather it acts as a mechanism for advancing sustainable development goals and human rights objectives. Re-calibrating the implementation of TRIPS in order to align the incentives for innovation and the rights of farmers to use their traditional seeds would provide a practical approach to aligning global trade obligations with the SDGs. Besides introduction and conclusion, the central parts of the article have been structured to include: the analysis on seeds and plant varieties in India; international and national IP framework related to it; contribution of the farmers as agent in advancement of SDGs. This article employs doctrinal research by analytical and descriptive method to arrive on viable observations and conclusions.

II. Seeds and Plant Varieties in India: An Overview

Seeds lie at the heart of agricultural life, yet development discourse often treats them as neutral inputs rather than as sites of power, control, and possibility.[15] The seeds and plant varieties carry actual and potential value besides genetic material and information.[16] It is fruit of labour of generations, accumulation of information and tested practices of community cultivators as farmers and breeders who breed, saved and exchanged it given social and ecological environments.[17] Hence, the farmers have been recognized as agents of sustainable agriculture and development. Related SDGs are also centered around the contribution of farmers considering them as harbinger of life on land and water. Farmer's act and influence interfere with soil health, crops production, use of water and fishing.[18] Generally, farmers use the practice of informal seed exchange and traditional breeding by selecting seed conducive to local soils, climatic

[15] Craig Borowiak, "Farmers' Rights: Intellectual Property Regimes and Struggle over Seeds", 32 *Economic & Political Weekly,* 511 (2004).
[16] FAO, International Code of Conduct for Plant Germplasm Collecting and Transfer, art. 2.8-2.9 (Adopted by 27th Session of the FAO Conference, Nov 1993) *available at:* https://www.fao.org/4/aj634e/aj634e.pdf (last visited on May11,2026)
[17] Wanglin Ma, Marco A. Marini and Dil B. Rahut, "Farmers' Organizations and Sustainable Development: An Introduction", 94 *Ann. Pub. & Coop. Econ*. 683, 683–700 (2023).
[18] T. Bernard and D. J. Spielman, "The Role of Farmer Organizations in Supplying Supermarkets with Quality Food in Vietnam", 34 *Food Policy,* 60 (2009).

conditions, and their communities.[19] This continuous process generated diverse plant populations that responded dynamically to environmental pressures. Innovation occurred in fields rather than in laboratories. It emerged through practice rather than formal recognition. Farmers did not treat seeds as exclusive property; they treated them as renewable resources embedded within social relationships.

In India, law relating to seeds has transformed the shared genetic resources into regulated objects of proprietary claims.[20] When legal systems define a plant variety, they typically emphasize characteristics such as distinctiveness, uniformity, and stability.[21] These criteria reflect the needs of commercial breeding and large-scale agriculture not the traditional breeding exercised by the rural farmers. This legal shift has significant implications for farmers' agency. When breeders obtain exclusive rights over protected varieties, they acquire control over the production, sale, and sometimes reuse of seeds. Farmers who purchase such seeds may face restrictions on saving, exchanging, or replanting harvested material.[22] Even where legal systems recognize certain farmers' privileges, these privileges operate within boundaries set by intellectual property regimes. The exclusive rights over plant varieties undoubtedly serve certain policy objectives but are applied in calibrating them in ways that do not undermine sustainable developmental goals.[23]

Seeds therefore operate as a hinge between intellectual property law and sustainable development. They connect global trade obligations to local farming realities. A development-oriented interpretation of TRIPS requires states to view plant variety protection not merely as a compliance obligation but as a policy instrument. States can interpret the requirement of an "effective" *sui generis* system in light of their

[19] Vandana Shiva and Kunwar Jalees, "*Seeds of Suicide: The Ecological and Human Cost of Seed Monopolies and Globalization of Agriculture"* 1 (Navdanya, New Delhi, 4th edn.,2006).
[20] Sumit Chakravarty *et al.,* "Farmers Rights in Conserving Plant Biotechnology with Special Reference to Northeast India", 13 *Journal of Intellectual Property Rights* 225 (2008).
[21] Kathy J. Cooke, " Expertise, Book Farming, and Government Agriculture: The Origins of Agricultural Seed Certification in the United States", 76 *Agricultural Hist*ory 524, 524–45 (2002), *available at*: https://www.jstor.org/stable/3744729 (last visited on May 11, 2026).
[22] Rashmi Venkatesan, "Trips and Plant Variety Protection in India: Assessing Conceptual implementation issues", 4 *Dehradun Law Review* 29,49-50 (2012).
[23] Craig Borowiak, "Farmers' Rights: Intellectual Property Regimes and the Struggle over Seeds", 32 *Politics & Society,* 515, 515-516 (2004).

developmental priorities.[24] Effectiveness need not equate to maximal exclusivity.[25] It can instead refer to a system that stimulates innovation while promoting food security, environmental sustainability, and equitable participation. By situating plant variety protection within the broader framework of the SDGs, States can align intellectual property regulation with commitments to poverty reduction and ecological balance.[26] Indian legal system prioritizes exclusive rights and commercial interests without meaningful safeguards, they risk the scope of farmer-led innovation in sustainable agriculture.[27] The rural farmers will become seed consumers instead of seed custodians due to reduced autonomy.

Farmers are the catalyst of sustainable agriculture and development. They cultivate the land, maintain genetic diversity, and are the first to respond to climate changes. When law recognizes their practice as valid and important, they allow farmers to actively contribute to sustainable development. On the other hand, when the law limits the practices without solid reasons, they reduce farmers' ability to act beyond simply using resources. The difference between these outcomes often depends on how countries use the flexibility found in international intellectual property law. In this context, discussion about seeds and plant varieties is not just about technical classifications. The focus is on who holds authority in agricultural systems. The question is whether development policy will see farmers as beneficiaries of top-down innovations or as partners in creating resilient food futures. By looking at how plant variety protection interacts with TRIPS flexibilities, one can determine whether current regulations support farmers as key agent in achieving sustainable development goals or restrict them within systems that limit their potential for change. Seeds has thus become starting point for a broader inquiry of international intellectual property law. It can support rather than hinder development focused agricultural governance.

III. International and National IP Framework on Seeds and Plant Varieties:

[24] Daniel Gervais, *The TRIPS Agreement: Drafting History and Analysis* 43-51 (Sweet & Maxwell, London, 2nd edn.2003).
[25] *Ibid.*
[26] *Id.*
[27] Philippe Cullet and Radhika Kolluru, *Plant Variety Protection and Farmers' Rights: Towards Broader Understanding*, 24 *Delhi Law Review*, 41-59 (2002)

An Analysis

Legal protection provided to seeds and plant varieties according to rights to the breeders and farmers in current times has been closely inspired by international legal regime for last three decades. Human generations, nations, and institutions have been inclined to protect and conserve their seeds, plant varieties, and biological resources,[28] as it plays decisive role in improving the overall economic development of the country. In recent times, introducing technology in agriculture led to the grant of intellectual property protection to the plants and seeds.[29] Biotechnology has also paved the way for new vistas in improved or modified varieties of plants. As a result, it became important to provide an effective system of plant variety protection by the way of patent, plant variety protection and *sui-generis* system based on international IP framework.[30] Therefore, it is essential to examine the international and national legal regime on the protection of plant varieties which exists since last three decades. The legal protection to seeds and plant varieties has been accorded by cross-sectional regimes under international law. For example, the '*Union International Pour La Protection Des Obtentions Végétales* (UPOV)' protects the plant varieties, the 'Convention on Biological Diversity (CBD)' deals with all genetic resources, the 'International Undertaking on Plant Genetic Resources (IUPGR)' covers only plant genetic resources and the 'Agreement on Trade Related Aspects of Intellectual Property Law (TRIPS)' regulates the microorganism and genetic information based on plants under intellectual property rights (IPRs). Accordingly, each nation makes its own legal framework for the protection of plant varieties and farmers varieties as per national interest and demand for trade, food security and environment.

(a) International Frameworks:

The 'International Convention for Protection of New Varieties of Plants known as UPOV is a multilateral treaty to protect new plant varieties which was adopted in Diplomatic Conference held in Paris on 2nd December 1961 by a group of Western European Nations with the specific aim of introducing private property rights on plant

[28] W.R. Cornish, *et.al*., *Intellectual Property: Patents Copyright, Trademarks and Allied Rights,* 48 (Sweet & Maxwell, London, 2013)
[29] *Ibid.*
[30] P. Narayanan, *Intellectual Property Law,* 30-31 (Eastern Law House, Kolkata, 4th edn. 2006).

varieties.'[31] After its subsequent revisions in 1972, 1978 and 1991, it protects interests and rights of the breeders on new plant variety; and establishes a uniform and clear international principles related to it. The breeder of a signatory to the UPOV have the advantage of priority rights for a period of twelve months from the date of filing his first application over applications of other breeders.[32] However, the date of filing application is excluded while calculating the period of priority rights. It also allows a breeder to make a choice in which country he first wants to apply for the protection.[33] However, breeder has to file independent applications for a single plant variety in each and every contracting party.[34] Corresponding to the UPOV 1961 and 1978, Articles 5 to 9 of UPOV, 1991 contain the conditions for the grant of a breeder's right. The new variety needs to be new, distinction, uniform and stable (NDUS).[35] A 'variety' must be new or novel. But the criteria of novelty are different from that of patent. As per UPOV, a 'variety' will be new if it has not been offered for sale or marketed with the consent of the breeder, prior to the filing of an application for protection in the territory where the application is filing.[36] The criteria of 'distinctness' simply requires that "a variety must be clearly distinguishable from any other variety whose existence is a matter of common knowledge at the time of the filing of the application."[37] The variety is deemed to be uniform if it is sufficiently uniform in its relevant character. However, the variations which are expected from a particular feature of the propagation do not affect the criteria of uniformity while examining the concerned variety.[38] "A variety is deemed to be stable if its relevant characteristics remain unchanged after repeated propagation or, in the case of a particular cycle of propagation, at the end of each such cycle."[39] On these conditions, the term of protection to new plant varieties to 20 years in all plants genera and species and 25 years in cases of vine and trees. The UPOV system offers protection to the 'breeder' of

[31] See, UPOV, International Convention for Protection of New Varieties of Plants', Dec. 2, 1961, 815 U.N.T.S. 89.
[32] The UPOV 1961 and 1978, Art. 12; and the UPOV 1991, Art. 11(1).
[33] The UPOV 1961 and 1978, Art. 11(1); and the UPOV 1991, Art. 10(1).
[34] The UPOV 1961 and 1978, Art. 11(3); and the UPOV 1991, Art. 10(2).
[35] *Ibid*. Art. 5.
[36] *Id*. Art. 6(1) (i).
[37] *Id*. Art. 7
[38] *Id*. Art. 8.
[39] *Id*. Art. 9.

a plant variety, in the form of a 'breeder's right,[40] if his or her 'variety' satisfies the conditions set out in the Convention. However, the term 'breeder'[41] includes "(a) the person who bred, or discovered and developed, a variety; or (b) the person who is the employer of the aforementioned person or who has commissioned the latter's work, where the laws of the relevant contracting party so provide; or (c) the successor in title of the first or second aforementioned person, as the case may be." The phrase 'the person, who bred' can include a plants-man, a farmer, a company or a scientist, must be the one who bred the variety by means of plant breeding techniques. Thus, any person, irrespective of their scientific or legal background, irrespective of the breeding method used and irrespective of the effort breeding method used and irrespective of the effort expended to create the variety, is a potential breeder including farmer. Another aspect of the UPOV system is the recognition of farmer's privilege for sowing, re-sowing, exchanging and even selling their own traditional plant varieties and seeds. UPOV,1978 provided farmer's privilege by allowing them to use their own harvested material of the protected varieties for the next production cycle on their farm and to undertake limited exchange of seeds on non-commercial scale, however, UPOV,1991 restricts this privilege. Notwithstanding the fact that the UPOV system is the first system of plant variety protection at international level.

The Convention on Biological Diversity (CBD) provides the legal protection to agricultural biodiversity, farmers' livelihoods, and sovereign rights to biodiversity.[42] The Conventions establishes three main goals: the conservation of biological diversity, the sustainable use of its components; and the fair and equitable sharing of the benefits of the use of genetic resources.[43] In the preamble the convention states that the contracting parties recognize "the close and traditional dependence of many indigenous and local communities embodying traditional lifestyles on biological resources, and the desirability of sharing equitable benefits arising from the use of traditional knowledge,

[40] *Id*. Art. 1(v).
[41] *Id*. Art. 1(iv).
[42] UNO, Convention on Biological Diversity, 1992; 1760 UNTS 79 (1992). It was adopted at the United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro, 1992. It was opened for signature on 5 June 1992 and entered into force on 29 December 1993.The CBD contains 42 articles and 2 annexures in *toto*.
[43] *Ibid*. Art. 1.

innovations and practices, relevant to the conservation of biological diversity and sustainable use of its components."[44] However, no article in the convention directly addresses farmers' rights or mechanisms for the compensation of indigenous knowledge. It refers to 'indigenous practices but not to rights of farmers or local communities,'[45] The convention has recognized the rights of local communities to a share in the benefits accruing from the use of genetic resources. The Convention further recognizes both: 'the dependence of local communities on biological resources and the role played by such communities in the conservation and sustainable use of the resources.'[46] It points out 'the need for equitable sharing of benefits arising from the use of their traditional knowledge, innovations and practices, relevant to the conservation of biodiversity and the sustainable use of its components.'[47] The CBD though does not specifically deal with the issue of plant varieties protection, but is of direct relevance because it encompasses all biological resources which are used in generating new plant varieties and patented drugs.

The 'International Treaty on Plant Genetic Resources for Food and Agriculture was adopted by the FAO conference in November 2001.'[48] The Treaty is essentially an adaptation of the IUPGR and is overseen by the FAO Commission on Genetic Resources along with governing body set up under the Treaty.[49] It encourages the conservation and protection of plant genetic resources through "national commitments and international cooperation"[50] for collections of seeds and plants as set out in its objectives. "The objectives of this Treaty are the conservation and sustainable use of plant genetic resources for food and agriculture and the fair and equitable sharing of the benefits arising out of their use, in harmony with the Convention on Biological Diversity, for sustainable agriculture and food security."[51] Further, all the parties to this Treaty has been given responsibility for "realizing Farmer's Right, as they relate to plant genetic resources for food and

[44] *Id.* Preamble.
[45] *Id.* Art. 10(c).
[46] *Id*. Art. 8(j).
[47] *Id*. Art. 15.
[48] FAO, International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA), Nov. 3, 2001, 2400 U.N.T.S. 303. It came into force on 29th June 2004.
[49] *Ibid*. Art. 15(1) (d).
[50] *Id*. Art. 7.
[51] *Id*. Preamble.

agriculture" and "to take measures through national legislation to protect and promote Farmer's Right."[52] Besides, it does not provide limitation to extent "the rights of farmers to save, use, exchange and sell farm-saved seed and varieties."[53] It is also important to mention that the Treaty does not ignores the efforts of farmers, but it seeks to recognize their role in protection of traditional knowledge, sharing of benefits, access to and transfer of technology.

The 'Agreement on Trade-Related Aspects of Intellectual Property (TRIPS) annexed as Annexure IC the Agreement establishing the World Trade Organization'[54] deals with aspects and subject matters of intellectual property including plant varieties and seeds. It recognizes dual need to "promote effective and adequate protection of IPRs; and to ensure that measures and procedures to enforce IPRs do not themselves become barriers to legitimate trade."[55] The Agreement requires all parties to meet certain minimum standards for protecting IP, defined as including copyrights, patents, plant varieties, industrial designs, geographic designations, the lay out design of integrated circuits and trade secrets. As per this agreement, the member states are free to decide and exclude plants and animals (other than micro-organisms) and essentially biological processes for the production of plants and animals (other than non-biological and microbiological processes) from patent regime. But where the member states opted for excluding plant from patents, then they were under obligation to protect plant varieties either "by patents or by an effective *sui generis* system or by any combination thereof."[56] By leaving 'plant varieties' undefined, TRIPS Agreement claims to provide effective protection of all plant varieties. Without setting substantive standards of protection, Article 27(3) (b) narrow down member's choice or regime by the 'effectiveness' requirement. The member states can even develop 'the best' method to protect plant varieties and seed that is suitable to their agriculture, trade and economic development.

The TRIPS Agreement also provides important flexibilities that allow member states

[52] *Id.* Art. 9 (2)
[53] *Id.* Art. 9 (3).
[54] WTO, Agreement on Trade-Related Aspects of Intellectual Property Rights, Apr. 15, 1994, Marrakesh Agreement Establishing the World Trade Organization, Annex 1C, 1869 U.N.T.S. 299, 33 I.L.M. 1197 (1994). It is divided into 7 Parts and contains 73 articles.
[55] *Ibid,* Preamble, Para. 1.
[56] *Ibid*. Art. 27(3) (b).

to adapt intellectual property protection to their national priorities and agricultural conditions.[57] It may be noted as: *firstly,* Article 27(3)(b) allows countries to exclude plants and animals from patent protection, while requiring them to provide protection for plant varieties through patents, an effective *sui generis* system, or a combination of both.[58] This flexibility enables governments to avoid strict patent regimes over seeds and plant varieties where such systems may not suit domestic agricultural practices. Scholars have noted that this policy space allows developing countries to design intellectual property systems that support their agricultural and developmental priorities.[59] *Secondly,* the Agreement does not define what constitutes an "effective *sui generis* system", thereby giving countries considerable freedom to develop plant variety protection laws suited to their social, economic, and agricultural realities.[60] This flexibility is particularly significant in countries where farming communities play a central role in conserving traditional seeds and maintaining crop diversity. Research on agricultural biodiversity highlights that farmers' traditional practices of saving, exchanging, and cultivating seeds contribute significantly to the conservation of plant genetic resources.[61] These flexibilities therefore provide an important policy space for countries to develop national legal frameworks that balance intellectual property protection with the needs of farmers, agricultural sustainability, and biodiversity conservation.

(b) National Framework:

In India, almost 75% of human population is dependent either directly or indirectly on agriculture. For the first time, India enacted its legislation for protection of seeds in year 1966. 'The Seeds Act, 1966' provides for measures/provisions regulating the quality of certain seeds for sale.[62] However, the sale of seeds from own holding of

[57] Agreement on Trade-Related Aspects of Intellectual Property Rights arts. 1, 8, Apr. 15, 1994, Marrakesh Agreement Establishing the World Trade Organization, Annex 1C, 1869 U.N.T.S. 299.
[58] Id. art. 27(3)(b).
[59] Carlos M. Correa, *Intellectual Property Rights, the WTO and Developing Countries: The TRIPS Agreement and Policy Options* 199–210 (2000).
[60] Daniel Gervais, The TRIPS Agreement: Drafting History and Analysis 357–366 (Thomson Reuters, 5th ed., 2021).
[61] Food and Agriculture Organization, *The State of the World's Biodiversity for Food and Agriculture* 89–94 (2019).
[62] The Seeds Act, 1966, Preamble.

notified kinds of seeds were exempted under the Act.[63] Even today since independence, improved or new variety/varieties of seeds are mainly produced/created by National Seed Corporation, State Farms Corporation of India, Agricultural Universities and Research Institutes established under public sector. Additionally, in order to save the Indian agriculture sector from the effect of patents, the Government of India exempted plants in whole (including seeds, varieties and species) from the ambit of patents under the Patents Act, 1970.[64] Till the year 1994, India managed to find an escape route to protect the interest of Indian farmers and did not introduce any form of protection over plants or its varieties or seeds. By ratifying TRIPS Agreement in 1994, India was under obligation to provide legal protection to seeds and plant varieties. Though plants as such can be exempted from the ambit of patents under Article 27 of TRIPS,[65] but then the signatory countries were bound to introduce either a patent protection or a *sui generis* protection or by any combination thereof.[66] Accordingly, the "Protection of Plant Varieties and Farmers' Rights Act, 2001" was enacted as a *sui generis* legislation in compliance with TRIPS obligations and flexibilities. Being a *sui generis* legislation, the unique aspects of this legislation relating to farmers are as such, "farmer is recognized as breeder, conserver and preserver of traditional varieties of crops and wild species in addition to cultivator, either directly or indirectly; protection is provided not only to new varieties; protection of varieties other than extant and farmer's varieties is limited to those genera or species notified; lenient procedure for the protection of farmer's varieties."[67]

The farmer's right includes the following main aspects: "right to register farmer's varieties; entitlement for benefit sharing for the use of biodiversity conserved by the farming community; right to save, use, sow, re-sow, exchange, share or sell farm produce including seed of registered variety but not the branded seed; right to claim compensation for under performance of a right protected variety from its promised level under defined production conditions; mandatory need to secure consent of farmer(s)

[63] *Ibid*. Sec. 24
[64] The Patent Act, 1970.
[65] The TRIPS, 1994, Art. 27 (3) (b)
[66] *Ibid.*
[67] *Id.*

when a farmer variety is used to develop an essentially derived variety (EDV); protection from legal proceedings related to alleged infringement; exclusion from paying fee in any legal proceedings in the tribunal and higher courts."[68] This Act protects plant varieties and seeds into four protectable categories: "(a) New Variety; (b) Extant variety, which refers to an existing variety discovered for the first time; (c) Farmer's Variety, based on community property concepts and (d) Essentially Derived Variety (EDV). A variety would be eligible for protection provided it is novel, distinct, uniform and stable."[69] Further, "every application for registration must include a denomination to the variety and describe (a) the geographical origin of the material; and (b) all information regarding the contribution of the farmer, community or organization in the development of the variety."[70] Also, "the application must state that the genetic or parental material used to develop the variety has been lawfully acquired."[71] Moreover, Section 40 necessitates the breeder to disclose information "regarding the use of genetic material conserved by any tribal or rural families in the breeding or development of such new variety."[72] This Act bears a set of public interest exceptions to registration of a new variety. For instance, "a new variety becomes un- registerable if it is likely to deceive the public, hurt the religious sentiments of any class or section of Indians, or cause confusion regarding the variety's identify or is not different from every denomination which designates a variety of the same botanical species or of a closely related species registered under the Act."[73]

This Act defines the term *'farmer'* from a community rights perspective as "those who cultivate crops by cultivating the land and those who supervise cultivation directly or indirectly through other people, or anyone who conserves and preserves, severally or jointly, with any other person… through selection and identification of their useful properties."[74] The manner of providing protection of "farmer's variety"[75] reflects a keen

[68] Protection of Plant Variety and Farmer's Right Act, 2001; Sec. 39- 46.
[69] *Id*. Sec. 15 (1)
[70] *Id*. Sec. 18 (1) (e)
[71] *Id*. Sec. 18 (1) (h)
[72] *Id*. Sec. 40 (1)
[73] *Id*. Sec. 15 (4)
[74] *Id*. Sec. 2 (k)
[75] *Id*. S. 2 (l)

sense of consideration for "community and traditional rights by including provisions for benefit sharing, community compensation"[76] immunity from "prosecution for innocent infringement"[77] and the "creation of a Gene Fund to collect breeder's annual fees."[78] Each of the rights not only represents a deviation from UPOV but also showcases rights contoured to suit unique national conditions.

Keeping this view in mind, this Act provides 'effective' protection to plant varieties in India. It includes definition of plant variety; creates a setup for the protection of plant variety; define the scope of protection and duration of protection; grants special rights to breeders of plant variety; balances the breeder's rights by providing exceptions such as farmer's privilege, researcher's right, compulsory licensing, etc. It also includes provisions of CBD such a prior consent and benefit sharing and creation of gene fund. In order to provide for the establishment of an effective system for protection of plant varieties, "the rights of farmers and plant breeders and to encourage the development of new varieties of plants the Protection of Plant Varieties and Farmer's Rights Authority (the Authority) has been established."[79] While granting protection to new plant varieties, the Act does not transgress the traditional rights of farmers and recognizes the historic contribution of generations of farmers for preserving, protecting and enriching this biodiversity, plant varieties, seeds and crop improvements in order to achieve the sustainable development goals (SDGs).

IV. Contribution of the Farmers as Agent in Advancement of SDGs: Custodians of Seeds and Plant Varieties in India

Farmers play a fundamental role in sustaining agricultural biodiversity and strengthening food systems across the world. In India, farming communities have historically preserved seeds and plant varieties through practices such as seed saving, selective breeding, and community exchange. From decades, farmers used to breed, develop and preserved the seeds and crops through continues trials and tests with local

[76] *Id*. Sec. 41

[77] *Id*. Sec. 42

[78] *Id*. Sec. 45

[79] *Id*, Sec. 3, The Authority's office is located at NASC Complex, DPS Marg, New Delhi – 110012

varieties and ecosystems. This has further helped modern agricultural research and global agriculture innovation.[80] As per international reports and documents, farmers' are the major conservers, producers and agents of sustainable agriculture using indigenous and innovative knowledge and practices in it. Their contributions in modern agriculture are immensely assessed and acknowledged especially building resilient food systems.[81] Besides, contribution of farmers as custodians of seeds has also been co-related with promotion of sustainable development preserving traditional crop varieties and maintaining diverse cropping systems. This clearly indicates towards achieving the SDG 2, SDG 13, and SDG 15.[82]

Farmers have preserved crop diversity for centuries through careful seed selection and cultivation practices. After each harvest, farmers typically select seeds from the healthiest plants or those that perform best under local environmental conditions. By repeating this process over generations, they gradually develop crop varieties that adapt to specific ecological environments.[83] Based on community networks and affiliation, farmers regularly exchange seeds with neighbors, relatives, and members of local farming communities to ensure that traditional seeds remain available for cultivation.[84] For this purpose, farmers procure seeds, share knowledge about cultivation techniques, and encourage the revival of indigenous crops.[85] In major States of India, farmers have established local seed banks so that their seeds could be collected, stored and distributed.[86] The preservation of traditional crop varieties plays an important role in climate adaptation. Many indigenous crops possess natural traits that allow them to withstand extreme weather conditions such as drought, floods, and

[80] FAO, "The State of the World's Biodiversity for Food and Agriculture" 3–5 (2019), *available at*: https://openknowledge.fao.org/items/b355c300-72ed-4a63-be07-8295c80ec7f1 (last visited on May 12, 2026)
[81] FAO, "The State of Food and Agriculture 2021: Making Agrifood Systems More Resilient to Shocks and Stresses" 15–18 (2021), *available a*t: https://www.fao.org/3/cb4476en/cb4476en.pdf (last visited on May 12, 2026).
[82] UNO, UN General Assembly Resolution 70/1, 2015, "Transforming Our World: The 2030 Agenda for Sustainable Development" (Oct. 21, 2015).
[83] Jack R. Kloppenburg Jr., *First the Seed: The Political Economy of Plant Biotechnology* 45–52 (The Board of Reagents of the University Wisconsin System, United States of America, 2nd edn. 2004).
[84] Vandana Shiva, *Earth Democracy: Justice, Sustainability, and Peace* 91–95 (Zed Books Ltd. London, 2005).
[85] FAO, "*Community Seed Banks: Origins, Evolution and Prospects*" 4–7 (Routledge, New York 2014).
[86] Ronnie Vernooy *et al., Community Seed Banks: Origins, Evolution and Prospects*, 23–28 (Routledge, New York, 2015).

high temperatures.[87] In Kerala's Kuttanad region, farmers cultivate traditional rice varieties that survive prolonged flooding. Because this region lies below sea level and frequently experiences waterlogging during the monsoon season, flood-resistant rice varieties developed by farmers allow agriculture to continue in this challenging environment.[88] Similarly, in coastal regions of Tamil Nadu and Kerala, farmers cultivate saline-tolerant rice varieties that survive in fields affected by seawater intrusion.[89] Farmers in drought-prone regions of Maharashtra have also revived traditional sorghum and millet crops that tolerate prolonged dry conditions.[90] The increasing global recognition of millets as climate-resilient crops led the United Nations to declare the International Year of Millets 2023.[91]

Farmers' preservation of crop diversity contributes not only to environmental sustainability but also to nutritional security. Traditional farming systems often involve the cultivation of multiple crops within the same agricultural landscape.[92] In central India, tribal communities' practice mixed cropping systems that combine millets, pulses, oilseeds, and vegetables. These diverse cropping patterns improve soil fertility while providing balanced diets within rural communities.[93] Traditional vegetable varieties preserved by farmers also contribute to dietary diversity. Many indigenous leafy vegetables and pulses contain high levels of micronutrients. Farmer-led initiatives and grassroots movements have played a significant role in conserving seed diversity in India. One well-known initiative is Navdanya, which works with farmers to preserve

[87] Intergovernmental Panel on Climate Change, *Climate Change and Land: Special Report, 2019;* 439–445 (Cambridge University Press, Cambridge, 2019), *available at:* https://www.ipcc.ch/site/assets/uploads/2019/11/SRCCL-Full-Report-Compiled-191128.pdf (last visited on May 12, 2026)

[88] K. N. Ninan and M. Sathyapalan, "The Economics of Biodiversity Conservation: A Study of Rice Varieties in Kerala", 42 *Ecological Economy,* 303, 305–07 (2002).

[89] R. K. Singh *et al*., "Traditional Rice Varieties for Climate Resilience in Coastal Ecosystems", 59 *Current Science,* 179, 181–83 (2010).

[90] FAO, *Sorghum and Millets in Human Nutrition* 33–35 (Publisher, Rome, 2018), *available at:* https://openknowledge.fao.org/handle/20.500.14283/t0818e (last visited on May 12, 2026).

[91] UNO, General Assembly Res. 76/253, "International Year of Millets 2023" (Mar. 3, 2022), *available at*: https://www.fao.org/millets-2023/en (last visited on May 12,2026).

[92] FAO, "The State of Food Security and Nutrition in the World" 72–74 (2022), *available at:* https://openknowledge.fao.org/server/api/core/bitstreams/67b1e9c7-1a7f-4dc6-a19e-f6472a4ea83a/content (last visited on May 12, 2026).

[93] B. Padulosi et al., "Underutilized Species and Climate Change: Current Status and Outlook", 2 *Crop Sci*. 15, 19–21 (2013), *available a*t: http://www.nuscommunity.org/uploads/tx_news/NUS_and _climate _change_2011.pdf (last visited on May 12, 2026).

indigenous seeds and promote biodiversity-based agriculture.[94] Another important example is the work of the Deccan Development Society. Women farmers associated with this organization maintain community seed banks and cultivate traditional millet varieties suited to dryland agriculture.[95] In southern India, farmers have also revived traditional rice varieties such as Mapillai Samba in Tamil Nadu.[96] The northeastern Indian state of Sikkim provides another example of farmer participation in sustainable agriculture through organic farming practices.[97]

Farmers across the world play a similar role in preserving agricultural biodiversity. In Peru, farmers cultivate hundreds of native potato varieties adapted to different altitudes and climatic conditions.[98] Likewise, farming communities in Ethiopia have preserved traditional varieties of crops such as teff, barley, and sorghum.[99] Despite their contributions, farmers face several challenges that threaten their role as seed custodians. The expansion of commercial agriculture has encouraged the widespread use of hybrid seeds that farmers cannot easily reproduce from their harvest.[100] As farmers increasingly depend on purchased seeds, traditional seed-saving practices decline.[101] Climate change further intensifies these challenges by increasing environmental uncertainty and disrupting traditional cropping systems.[102] In this way, farmers in India can also be appreciated as agent for promotion of food security and sustainable

[94] Vandana Shiva, *Navdanya: Biodiversity Conservation and Farmers' Rights* 14–18 (2007); *available at*: https://navdanya.org/biodiversity-based-organic-farming/ (last visited on May 12, 2026).
[95] P. S. Rao, "Women Farmers and Agro-Biodiversity Conservation: The Experience of the Deccan Development Society", 37 *Economic and Political Weekly,* 3456, 3458–60 (2002).
[96] S. Karthikeyan, "Revival of Traditional https://docs.un.org/en/A/RES/70/1 Rice Varieties in Tamil Nadu", 54 *Economic and Political Weekly,* 52, 54–56 (2019)
[97] The World Economic Forum, The Indian State has gone 100% Organic, October 12, 2018; *available at:* https://www.weforum.org/stories/2018/10/this-indian-state-has-gone-100-organic/ (last visited on May 12, 2026).
[98] Karl Zimmerer, *Changing Fortunes: Biodiversity and Peasant Livelihood in the Peruvian Andes* 32–38 (University of California Press, California,1996), available at https://www.jstor.org/stable/jj.2711649 (last visited on May 12, 2026).
[99] Melaku Worede *et al*., Ethiopian Farmers' Role in Conserving Crop Genetic Resources, 26 *Plant Genetic Resources Newsletter* 1, 3–6 (2000).
[100]UNEP, *Agriculture at a Crossroads* 64–68 (2009), *available at:* https://www.unep.org/resources/report/agriculture-crossroads-global-report (last visited on May 12, 2026)
[101] Food & Agric. Org. of the U.N., *The Future of Food and Agriculture: Trends and Challenges* 32–36 (2017), available at https://openknowledge.fao.org/handle/20.500.14283/i6881e (last visited on May 12, 2026).
[102] Intergovernmental Panel on Climate Change, *Climate Change 2022: Impacts, Adaptation and Vulnerability* 1045– 52 (2022), *available at:* https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_FullReport.pdf (last visited on May 12, 2026).

development.

V. Conclusion

Farmers play a vital role as custodians of seeds and plant varieties for achieving sustainable development goals. Using practices such as seed saving, crop diversification, and community exchange, they preserve agricultural biodiversity and strengthen sustainable food systems. These traditional practices have helped farming communities conserve plant genetic diversity and maintain resilient agricultural systems that adapt to changing environmental conditions.[103] Not only this, farmers contribute to these SDGs by "maintaining diverse cropping systems, protecting soil health, and sustaining community-based seed systems that support long-term food security."[104] The existing seed legislations and TRIPS flexibilities, can basically support the mission of sustainable development and role of farmers as agent is instrumental in it. The sustainable agriculture and production based on the seeds and plant varieties and preserved by the farmers can help in promoting resilient food systems and food sustainability in India. Recognizing the farmers as custodian of seeds and plant varieties and agent of sustainable development goals will strengthen the principles, practices and goals of sustainable development.

[103] Food & Agriculture Organization, *The State of the World's Biodiversity for Food and Agriculture* (2019), *available at*: https://openknowledge.fao.org/handle/20.500.14283/ca3129en (last visited on May 12, 2026).

[104] UNO, United Nations General Assembly Resolution 70/1, *Transforming Our World: The 2030 Agenda for Sustainable Development* (Sept. 25, 2015), *available at:* https://docs.un.org/en/A/RES/70/1 (last visited on May 12, 2026).