SEEDS OF CHANGE: AN ANALYSIS OF LAWS AND POLICIES IN INDIA

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ABSTRACT

The agricultural sector has been a dominant force in the Indian economy, owing to its high level of workforce engagement, despite its declining contribution to the overall economy; this notion was reiterated during farmers' protests. Over the years, the sector has made significant progress, moving from a food deficit to an export surplus industry. This transformation cannot negate technology and innovation's role in high-yielding crop productivity varieties. Presently, the sector mandates more productivity compared to workforce engagement and land utilized in agriculture. Given that land is a limited resource and rapid extraction of the workforce is unworkable, the only viable solution is to supply quality inputs via seeds to boost production. Unfortunately, the sector is regulated by an obsolete Seeds Act of 1966, which fails to cater to farmers' rights, breeders' interests, and emerging issues such as seed sovereignty and the right to farm-saved seeds, which have assumed the status of human rights. The article intends to examine strategies for improving crop productivity and identify impediments existing in the legal, institutional, and regulatory framework, examining reasons for the same along with suggestions, as the sector contains the potential to cater multiple objectives like food security, environmental protection, fiscal deficit, the financial well being of agriculturalists and the seed industry.

Keywords: Agriculture, Seeds Act 1966, Seed Sovereignty, Farm saved seeds, PPVFR Act 2001, Seed Bill 2019.

I. INTRODUCTION

"Most of the world's poor people earn their living from agriculture, so if we knew the economics of agriculture, we would know much of the economics of being poor."[1]

- Theodore Schultz

Agriculture remains the predominant sector of the Indian economy; despite its unsatisfactory performance, the recent farm protest has ratified this notion. The agricultural contribution to Gross Domestic Product (GDP) depreciates from 18.2% in 2014-15 to 16.5 % in 2019-20, [2] despite agriculture's employment hovering around 56-58% of GDP. [3] This scenario exhibits a substantial decline in the agri-economy, yet it does not indicate a decrease in the population cultivating and supporting agriculture. In order to balance the share of agriculture in both overall output and employment, nearly 84 million agri-workers should have been transitioned to non-farm sectors in 2011-12.[4] A precursory glance at the growth trajectory of the last five decades of agriculture and non-agriculture from 1971 to 2021 exhibits lamentable propensities; the growth rate of the agri-sector was 2.10% in 1980-81, while that of the non-agricultural sector was 4.93% and after 1991, the growth percentage of both the sectors rose to 3.67% and 7.5%, respectively; while the year 2020-21 recorded the growth rate of 3.59% and 7.19%..[5] This poor agricultural growth has profound implications because an extensive section of India's population depends on agriculture for livelihood and economic growth. Simultaneously, the economic growth rate measured by the Gross Value Added (GVA) during different periods of estimation for the agriculture and non-agriculture sector, as presented in Table 1, depicts that even the advent of new technology in 1966-67 failed to impact the growth of agriculture and allied sectors positively. The impact was only noticeable after 2004 and more recently in 2021-22. On the other hand, the non-agricultural sector, which drives

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[1] Economic Survey 2015-16, *Agriculture: More from Less*,https://www.indiabudget.gov.in/budget2016-2017/es2015-16/echapvol1-04.pdf

[2] Neelam Patel, Bruno Dorin et.al., *A new paradigm for Indian agriculture from Agroindustry to Agroecology chapter Is India Headed for a World without Agriculture,* https://www.niti.gov.in/sites/default/files/202204/Working_Paper_on_Agriculture_With_Cropmarks_060402022.pdf.

[3] Economic Survey 2019-20, Agriculture and food Management,2, https://www.indiabudget.gov.in/budget2020-21/economicsurvey/doc/vol2chapter/echap07_vol2.pdf.

[4] Ramesh Chand, S K Srivastava, et.al.,*Changes in Rural Economy of India, 1971 to 2012 Lessons for Job-led Growth*, Economic and Political Weekly https://www.niti.gov.in/sites/default/files/2021-08/5_EPW_Article_Changes_in_Rural_Economy_of_India_1971_to_2012.pdf. (last visited on Nov. 4, 2023)

[5] Ramesh Chand, *Agriculture in Post Independence India Looking Back and Looking Ahead,* Niti Aayog https://www.niti.gov.in/sites/default/files/2021-09/ICAR-Lecture-by-Prof-RameshChand09242021.pdf . (last visited on Nov. 14, 2023)

economic growth, saw some benefits after introducing a liberalized market. As per NITI Aayog, the growth rate in GVA increased significantly to 6.58% from 2010-11 to 2019-20 at 2011-12 prices. During this period, there was a rapid decline in the share of agriculture in the total economy, while there was a surge in the share of non-agricultural sectors.[6]

Period of Estimation	**1950-51 to 1964-65**	**1967-68 to 1990-91**	**1990-91 to 2004-05**	**2004-05 to 2020-21**	**2021-22**
Agriculture and allied	2.54	2.53	2.74	3.56	3.9
Non-Agriculture	5.86	5.31	7.39	6.90	6.90

*1966-67 period is driven by advent of new technology , 1990-91 is the period of globalization.[7]

(TABLE -1)

ANALYSING AGRICULTURAL INCOME & NON-AGRICULTURAL INCOME:

The deceleration in agricultural growth has coincided with a decline in income. Determining farm income is a complex process, as it can vary greatly depending on whether the farming is subsistence or commercial. Typically, farm income is calculated by subtracting input costs from output value. However, accurately estimating the cost of inputs and services can be difficult, as farmers may purchase or supply them. As such, calculating farm income has presented a challenge. However, several methods have been created to determine it, such as utilizing the Swaminathan formulae.[8] Although many Indian farmers have small or marginal

[6] Ramesh Chand & Jaspal Singh, *Workforce Changes and Employment Some Findings from PLFS Data Series*, Niti Aayog Discussion Paper, (2022), 1, https://www.niti.gov.in/sites/default/files/2022-04/Discussion_Paper_on_Workforce_05042022.pdf.

[7] *Supra* note 5.

[8] The cost of agricultural crop production can be divided into three categories: A2, A2+Family Labour (FL), and C2. A2 cost includes expenses related to agri-inputs like seeds, fertilizers, pesticides, hired labour, rent for leased land, interest on working capital, and depreciation on implements and farm buildings. A2+FL cost includes A2 cost plus the value of unpaid family labour. C2 cost includes expenses incurred over and above A2+FL, which

holdings, some experts have been puzzled by the notion that they only grow crops for personal consumption rather than for a marketable surplus. However, this perspective has shifted, as most agricultural production now contributes to farmers' income. The success of agricultural income is mainly dependent on factors such as productivity, production technology, the types of crops grown, and the cost of inputs and outputs.[9] After 1992-97 period, agricultural GDP grew about 3.4 % annually but then slowed to about 2.3 % (1997-01); [10] despite bypassing of traditional input-use methods like human and bullock labour, farm-grown seeds, manure and traditional irrigation methods, and introduction of modern inputs like improved/HYV seeds, chemical fertilizers, farm machine and tube wells for irrigation. There has been a steep decline in the per capita income of agriculturalists compared with other labour forces involved in non-agricultural activity. Farm income increased by 2.20% in the pre-green revolution era, and input costs increased by 2%. The adoption of green revolution technology raised input use, accelerating output growth to 2.80 %. The growth increased to 3.02% from 1980-81 to 1996-97. In 1996-97, inputs depreciated by 2%, resulting in a 50% fall in output growth.[11] This proves that the either crop production cost or profitability of crop enterprise remain the same or declined, and agriculture continues to be a loss making arrangement.[12] In 1971, a non-agricultural laborer earned 3.55 times as much as an agricultural laborer, which rose to 5.22 times in 2001. By the year 2010, the income of a non-agriculture worker exceeded that of a farmer by Rs 1.42 lakh annually. These abnormal income variations and growing disparities caused by the 1991 liberation policy which calls for much-needed reforms in the agriculture sector. Another factor responsible for depreciating farm income is the import of massive quantities of edible oil, pulses, fruit and vegetables, which would fetch good income if cultivated in India. Moreover, the rapid increase in income of the middle class and consequent

incorporates A2+FL cost, interest on the value of owned capital assets (excluding land), and rental value of owned land (net of land revenue). However, the NCF did not specify which definition (A2 or A2+FL or C2) of cost of production should be considered while fixing MSP. *See*, Sthanu R Nair, *The Curious Case of Minimum Support Prices* , The New Indian Express,(Oct. 26, 2020),https://www.newindianexpress.com/opinions/2020/oct/26/the-curious-case-of-minimum-support-prices-2215054.html

[9] Ramesh Chand, *MSP and Farmers's Income*, Making of New India Transformation under Modi Government, https://www.niti.gov.in/sites/default/files/2021-08/12_MSP_and_Farmers_Income.pdf. (last visited on Nov.18, 2023)

[10] Ashok Gulati & Rip Landes, *Farm Sector Performance and Reform Agenda*, Economic & Political Weekly, (Aug.7, 2004), https://www.epw.in/journal/2004/32/special-articles/farm-sector-performance-and-reform-agenda.html.

[11] Ramesh Chand, *Farm Incomes in India :the context of Development and Institutions* , Gopal K.Kadekodi and Brinda Viswanathan, *Agricultural development, Rural Institutions and Economic Policy*,59-81, (Oxford University press,1st edition New Delhi, 2009)

[12]S.K. Srivastava, Ramesh Chand et.al.,pal, *Changing Crop Production Cost in India: Input Prices, Substitution and Technological Effects*, 30, Economics Research Review (2017),https://www.niti.gov.in/sites/default/files/202108/2_Changing_cost_of_crop_production_Srivastava_et_al.pdf. (last visited on Dec.7, 2023)

change in eating habits has shifted the consumption patterns from agricultural to non-agricultural food items. The absence of market facilities, post-harvest infrastructure, logistics and quality seeds has been a primary driver of the degrading situation of the agricultural sector.[13]

PHASES OF AGRICULTURE IN INDIA:

Over the last fifty years, agricultural policies have been categorized into three phases. From 1950-51 to 1960, the first phase saw significant agricultural reforms, institutional changes, and major irrigation projects. During this time, intermediary landlordism was eliminated, land ceiling Acts were enacted, and cooperative credit institutions were fortified. The second phase was the Green Revolution era, which aimed to enhance productivity and achieve self-sufficiency in food grains through technological advancements and the introduction of new yielding varieties of wheat and rice. Between 1965-66 and 1971-72, a notable increase of 30 million tons of wheat and rice production was 16% higher than in 1950-51. As a result, per capita daily food production increased from 0.91 kg in 1970 to 1.82 kg around 2020.[14] The government provided input supplies such as irrigation water, subsidized fertilizers, and HVY seeds at prices below the cost of production. In return, MSP was implemented to safeguard farmers from unfavorable weather conditions and price fluctuations. Agricultural Produce Marketing Committees (APMC) and Public Distribution Systems (PDS) were used for procurement and distribution.[15] Market liberalization in 1991, during the third phase, indirectly affected the agriculture sector. An unrestricted and open domestic market is the characteristic of a liberalized economy. However, due to a dearth of internal liberalization and domestic reforms, the agri-sector failed to exploit the prospect, reap benefits from the WTO regime, and find it difficult to compete with imports and slow agricultural growth. That is why a reiteration for domestic agricultural reform involves reorienting the legal, regulatory, and institutional framework with greater participation of the private sector. The recent farm laws were passed to consolidate the Essential Commodities Act of 1955, regulate the APMC mechanism, promote corporate farming, and focus on the seeds and pesticide industry, fertilizer, irrigation,

[13]Ramesh Chand, *New Farm Acts: understanding the Implications*, Niti Aayog, (2020), https://www.niti.gov.in/sites/default/files/2020-11/NewFarmActs2020.pdf. (last visited on Dec.5, 2023)

[14] Ramesh Chand, *Advance Equitable Livelihoods*, United nations Food systems summit: 2021, 1 https://www.niti.gov.in/sites/default/files/2021-12/UNFoodSystemsSummit31122021.pdf.(last visited on Dec. 15, 2023)

[15] Shweta Mohan, *Legal regulation of Agricultural Procurement and Processing in India* , Satyam law International, New Delhi (2013)

and crop diversification. Additionally, improving agricultural infrastructure and technology, along with enhancing accessibility to existing technologies and biotechnology, including using Genetically Modified Organisms (GMOs) and transgenic crops, has the prospect of increasing farmers' incomes and uplifting their standard of living.[16] After the Green Revolution, agricultural growth has been hindered due to limited land and a lack of significant progress in research and development. M S Swaminathan suggested viewing low-yield areas as yield reservoirs and assets for future sector development to bridge the gap between potential and actual yield, which can be achieved by enhancing productivity through advanced technology, focusing on modernizing seeds and the seed industry, which would significantly increase agri income.[17] Over the past five decades, the agri-production has achieved remarkable growth, as the production of food grains has surged from 50 million tons in 1947,[18] to an estimated 308.65 million tons in 2021-22, [19] higher than 11.15 million in 2019-20. In the last six years, from 2015-16 to 2020-21, there has been a consistent increase in rice, wheat, and coarse cereals production at compound annual growth rates (CAGR) of 2.7%, 2.9%, and 4.8%, respectively; coupled with the CAGR for pulses, oilseeds, and cotton has been 7.9%, 6.1%, and 2.8%.[20] The progress assembled is scarce if approximated to the total workforce engagement and budget allocation. Therefore, the committee responsible for doubling farmers' income by 2022 has identified several consequential parameters that ought to be improved, including crop productivity, cropping intensity, diversification towards high-value crops, and ensuring farmers receive remunerative prices.[21] The preliminary intent of this paper is to examine strategies for improving crop productivity through the implementation and advancement of technology, research, and development within the seed sector. However, despite various programs, state interventions, and efforts, the seed sector has confronted innumerable legal, institutional, and regulatory impediments that have precluded it from accomplishing its intended results. It is critical to recognize and comprehend these impediments and their underlying rationales to propose recommendations for addressing them, as the sector possesses the prospects to accomplish numerous objectives, including contributing to food security, environmental protection, fiscal deficit markdown, and the economic health of both

[16] *Supra* Note 11.
[17] Uma Kapila, *Indian economy performance and policies*,262, (Academic Foundation 17th edition ,New Delhi, 2016-17).
[18] National Seed Plan, 1, https://nsai.co.in/storage/app/media/National%20Seed%20Plan.pdf.(last visited on Dec.28, 2023)
[19] Economic Survey 2021-22, https://www.indiabudget.gov.in/economicsurvey, (last visited on Dec.14, 2023).
[20] *Ibid.*
[21]Economic Survey 2018-19,2, https://www.indiabudget.gov.in/budget2019-20/economicsurvey/doc/vol2chapter/echap07_vol2.pdf.(last visited on June 04, 2022)

agriculturalists and the seed industry. Further, it is imperative to specify the positioning of emerging issues like 'seed sovereignty' or the farmer's right to 'farm-saved seeds' contrasted with breeders' rights in the governing framework, as these have acquired the status of concomitant rights under the extended interpretation of human rights.

II. ANALYSING SEED SECTOR IN INDIA

As articulated by NITI Aayog, agricultural productivity is contingent upon three crucial factors: seeds, fertilizers, and pesticides. The Green Revolution in India is a remarkable example of the successful incorporation of this trio, including the incorporation of high-yielding seed varieties, optimal fertilizer usage, irrigation expansion, and innovation, which has played a pivotal role in addressing food scarcity and lessening the country's reliance on wheat imports, enabling the implementation of PDS and the generation of exportable surpluses. Concerning seeds, which are considered as true carriers of technology, quality seed can surge 20 -25 % productivity. Therefore, the adoption of quality seeds is critical along with other inputs to improve agricultural output**.** In India three sets of institutions discharge the obligation of producing seeds: research institutions and agricultural universities; public sector seed producing corporations; and private sector firms including multinationals. The major breakthrough occurs in the seed sector is the rapid production of quality seed, and effective competition between public and private sector.[22] The advancements in seed technology have undoubtedly resulted in better access to high-quality seeds. However, it is concerning that the seed replacement ratio (area under certified quality seeds with farm-saved seeds) remains relatively low. Notably, selling inferior and counterfeit seeds in the market exacerbates this issue. In response, the government has implemented the New Seed policy, simplifying procedures and allowing for up to 100% FDI through the automatic route, and even, establishing a seed bank is a step towards mitigating these challenges.[23] Despite, immediate attention needs to be given, especially regarding affordability; as the cost of HYV is high, the farmer depend on the market, affecting the viability of farming. Secondly, the issue pertains to availability, as quality seeds face shortages in the supply; only competition between private

[22] By the year 2001-02, public sector had developed only 15 hybrids compared to 150 by the private sector. Similarly, in maize the number of hybrids developed by private and public sector were 67 and 3, respectively. In the next seven years, share of public sector increased from 8 to 19% in cotton, 4 to 40% in maize and 25 to 58% in rice. Similar changes are observed in the case of other crops. Cotton and maize have been the most favourite crops for development of hybrids both by public and the private sectors. Private sector also evinced strong interest in pearl millet, sunflower and sorghum .*Id.*at 14.

[23] *Id*.at 15.

and public can ensure quality seeds instead of banning non-certified seeds. Thirdly, inadequate research and genetic engineering in public and private sectors have constrained the development of seeds and seed technologies for major crops. Fourthly, there are impediments to introducing GM crops and seeds owing to their affordability and environmental and ethical issues, [24]and Lastly, dearth of robust regulatory mechanisms to deter the sale of spurious seeds, including provisions for holding seed companies accountable for non-performance and compensating farmers, mandatory disclosure of seed traits on product packaging and websites, and a mechanism for quick testing to identify fake seeds during the sale.. [25]

EVOLUTION OF INDIAN SEED SECTOR:

The seed industry expanded at a rapid pace of 20.59% during 2010-2015 with a valuation of Rs. 141.24 billion in 2015, and it is probable to inflate up to Rs 18,000 crores, [26] owing to the prompt adoption of BT cotton hybrids, single cross corn hybrids and hybrid vegetables.[27] According to estimates, the public sector's share decreased from 42.72% in 2017-18 to 35.54% in 2020-21, while the private sector's share increased from 57.28% to 64.46%.[28] The growth of this sector depends mainly on the acquisition and adoption of technology in production and marketing.[29] The seed industry development in India was relatively late, with no seeds available from 1950 to 1963. Consequently, in 1966 the Seeds Act, 1966 was passed with the aim to boost seed industry and to ensure quality seeds.[30] Seeds Act recognizes three stages for seed production: breeder seed, foundation seed and certified seed, made available to farmers for planting.[31] Until 1980, the production of seeds was dominated by the public sector, with the government being responsible for breed, multiply, and overall distribution. Several institutions

[24]Economic Survey 2015-16, Prices, Agriculture and Food Management,105-107, https://www.indiabudget.gov.in/budget2016-2017/es2015-16/echapvol1-04.pdf

[25] *Raising Agricultural Productivity and Making Farming Remunerative for Farmers*, Task Force on Agricultural Development constituted by the NITI Aayog, (2015),https://www.niti.gov.in/sites/default/files/2019-07/RAP3.pdf.

[26]Radheyshyam Jadhav, *Private sector's share in India's seed industry expands to 65 percent*, The Hindu Business Line, (July, 3, 2021"), https://www.thehindubusinessline.com/data-stories/data-focus/private-sectors-share-in-indias-seed-industry-expands-to-65-per-cent/article35101260.ece(last updated on Dec.02, 2023)

[27]Indian council of Agricultural research, *Indian seed market*, https://www.icfa.org.in/assets/doc/reports/Seeds.pdf.
(last visited on May 18, 2022)

[28] *Supra* note 26.

[29] V. R. Gadwal , *The Indian seed industry: Its history, current status and future,* Current Science , 10 February 2003, 84, 3,https://www.jstor.org/stable/24107423.

[30] Niranjan Rao, *Indian Seed System and Plant Variety Protection*, 39, 8, Economic and Political Weekly, ,847, https://www.epw.in/journal/2004/08/special-articles/indian-seed-system-and-plant-variety-protection.html.

[31] *Id.* at 846

were established to regulate and enhance the functioning of this sector. However, in the 1980s, the private sector slowly began to venture into the seed industry, starting with seeds of vegetables and flowers. Despite the potential benefits, the private sector's contribution to the seed industry remained low for various reasons, such as land ceiling laws and customs duties on farming equipment, making it economically unviable. Nevertheless, with time, the private sector's exploration of the seed industry increased, and the number of private companies in this sector rose from only three in the 1970s to forty in 1995.[32]

LEGAL, INSTITUTIONAL AND REGULATORY FRAMEWORK:

The legal framework regulating the seed industry in India encompasses various statutes, regulations, directives, proposed laws, and policy papers discussed hereinafter.

THE SEEDS ACT, 1966:

The Act focuses on ensuring the standard of Seeds available for purchase, leading to private companies entering the seed industry. The Seed Rules of 1968 and the Seed (Control) Order of 1983 supplement the framework established by the Act. Some of the vital features of the Act include: It led to the establishing of a Central Seed Committee consisting of eight members, which advises both the central and state governments on matters related to the administration of the Act.[33] Additionally, a Central Seed Laboratory was set up to analyze registered seeds, [34] and Seed Analysts were appointed to conduct seed testing.[35] Seed inspectors were also appointed,[36] and given the power to take seed samples for analysis by the Seed Analysts.[37] The central government has the authority to create regulations governing the operations of institutions such as the Central Seed Committee, National Seed Laboratory, Seed Inspector, and Seed Analyst, etc.[38] The Seed Rules of 1968 provide detailed procedures under the 1966, Act.

THE PROTECTION OF PLANT VARIETIES AND FARMERS RIGHTS ACT, 2001:

In 2001, a significant milestone was achieved in plant variety with the introduction of the

[32] *Id.* at 847,848
[33] The Seeds Act, 1966, Section 3.
[34] The Seeds Act, 1966, Section 4.
[35] The Seeds Act, 1966, Section 12.
[36] The Seeds Act, 1966, Section 13(1).
[37] The Seeds Act, 1966, Section 14.
[38] The Seeds Act, 1966, Section 25(2).

Protection of Plant Varieties and Farmers' Rights Act. The preamble of the Act suggests that the rights of breeders and farmers aim to propel the wheels of agriculture forward by providing more and better-performing varieties that enhance the country's agricultural productivity and remuneration for research and innovation. Initially, the Indian government was reluctant to introduce Intellectual Property Rights (IPR) in the agricultural domain, owing to the fear of compromising farmers' rights. However, the government eventually assented to technological innovations, considering that most farmers were marginal. Even domestic and international seed associations pressed for breeders' rights, given that no patent protection existed in India compared with the USA. However, India had to consent to international pressure, and Article 27.3(b) was introduced after rigorous deliberations during the Uruguay round of TRIPS negotiations. This flexibility was introduced to allow free trade flow among nations and bring them to the same level as the developed countries while also fulfilling their domestic requirements.[39]The Act outlines three distinct roles for farmers: cultivators, conservators, and breeders. Firstly, they can protect their traditional methods of sowing and utilizing farm-saved seeds for the next harvest season or sharing them. Secondly, farmers can register their varieties.[40] Thirdly, farmers actively preserving the genetic sources of land and wild relatives of economic plants and improving them through selection and preservation are recognized and rewarded under this Act. Further, farmers were granted the right to register any new variety they have bred or developed under Section 39 of the Act. The Act also protects farmers, allowing them to continue using, sowing, re-sowing, exchanging, sharing, or selling their farm produce, including seeds of the variety, just as they were entitled to before the Act was implemented. During registration, the applicant must provide full disclosure of any information related to the use of genetic material that rural or tribal families may have conserved during the breeding or development of the variety.[41] Any claim related to the development of a particular variety can be attributed to the contribution of a village or local community members.[42] An innocent infringer can assert protection under Section 42. The provision is laudable as illiterate farmers may not be conscious of the existence of registration of a variety under the Act. To

[39] Generalized System of Preferences (GSP) provides opportunities for many of the world's poorest countries to use trade to grow their economies and climb out of poverty. In addition to promoting economic opportunity in developing countries, the GSP program ensures affording worker rights to the people in beneficiary country, in enforcing intellectual property rights, and in supporting the rule of law *See,* Generalized System of Preferences (GSP), https://ustr.gov/issue-areas/trade-development/preference-programs/generalized-system-preference-gsp#:~:text=U.S.%20trade%20preference%20programs%20such,oldest%20U.S.%20trade%20preference%20program (last visited on Dec.18, 2023).

[40] The Protection of Plants Varieties and Farmers Rights Act, 2001, Section 39(1).

[41] The Protection of Plants Varieties and Farmers Rights Act, 2001,Section 40.

[42] The Protection of Plants Varieties and Farmers Rights Act, 2001,Section 41(1).

ease the economic burden, farmers or their groups are not mandated to pay any fees for document inspections or acquiring a judgment or decree under this Act.[43] The authority is permitted to impose an annual fee on breeders with prior approval from the Central government. This legislation aims to promote the conservation, cultivation, and breeding of various varieties, and farmers should be motivated to continue their efforts in this regard.[44] To support farmers, the government can take necessary measures such as waiving the annual fee for maintaining the registration of "their own" varieties.45 Further, it necessitates the breeder to obtain the prior consent of farmers who have contributed to the development or preservation of a crop variety.[46] To ensure the conservation and sustainable use of genetic resources, a National Gene Fund has been established as a mechanism for sharing benefits and providing funding for related expenditures. [47] The registration for trees and vines shall be valid for nine years while that of other crops shall be for six years[48] and the same can be renewed subject to a maximum of duration of 18 years in case of trees and vines and 15 years in case of extent variety and other cases as well. The breeders are conferred with the privilege to carry out research and experiment on any registered variety and to use them for creation of other varieties.[49] The PPVFRA Act of 2001 is a significant law that provides farmers and breeders with essential protections, privileges, exemptions, and opportunities for innovation. It has been instrumental in inspiring the enactment of similar legislation in other countries, such as the Philippines.[50]

The effectiveness of the Protection of Plant Varieties and Farmers' Rights Act (PPVFRA) is tested in *PepsiCo India Holdings Pvt. Ltd. v Bipin Patel.* [51] PepsiCo India Holdings filed an injunction suit against potato farmers in Gujarat for 'illegally' cultivating its variety registered under the Act. PepsiCo held a registered potato variety, FL 2027 (FC-5), used in Lay's chips and licensed to select farmers. It sued Gujarat farmers under Section 64 of the PPVFR Act for unauthorized use, while farmers cited protection under Section 39 for using farm-saved seeds. An ex-parte injunction sparked nationwide protests over farmers' rights. Under public pressure,

[43] The Protection of Plants Varieties and Farmers Rights Act, 2001,Section 44.
[44] The Protection of Plants Varieties and Farmers Rights Act, 2001,Section 35(1).
[45] Parameswaran Prajeesh, *Farmers' Rights to Seeds: Issues in the Indian Law Source*, Economic and Political Weekly, 50,12, (Mar. 21, 2015), https://www.jstor.org/stable/24481932 (last visited on Dec. 27, 2023).
[46] The Protection of Plants Varieties and Farmers Rights Act, 2001,Section 43.
[47] The Protection of Plants Varieties and Farmers Rights Act, 2001,Section 45.
[48] The Protection of Plants Varieties and Farmers Rights Act, 2001,Section 24.
[49] The Protection of Plants Varieties and Farmers Rights Act, 2001,Section 30.
[50] Rajeswari Kanniah, *Plant Variety Protection in Indonesia, Malaysia, the Philippines and Thailand*, 8 J. WORLD INTELL. PROP. 283 (2005).
[51] Commercial Trademark Suit No.23 /2019,Ahmedabad.

PepsiCo withdrew the cases in 2019. Later, activist Kavitha Kuruganti filed a petition to revoke PepsiCo's variety registration before the PPVFR Authority in *Kavitha Kuruganti v. Pepsico India Holdings Private Ltd.,*[52] under Section 34(a), (b), (c) (f) and (h).[53] Further, it was asserted before divison bench of delhi high court that PepsiCo, founded on erroneous information, claimed registration as 'new variety' instead of 'extant variety' and functioned contrary to the farmer's right under Section 39(1) (IV), which is the essence of the Act.[54] While considering the protection to FL2027 as a 'new variety', the registrar noted the documents submitted were improper and registered it as an 'extant variety'. The Authority declared oral assignment between the original and registered breeders legally invalid. It fell within the purview of section 18(3) and Rule 27(2) of the PPVFRA Act, 2001 and, therefore, revoked under section 34(a), (b), (c) (f) and (h). The prominent issue presented before the Authority was whether the farmers had violated the rights of PepsiCo or breeders by cultivating a variety protected under the Act. Additionally, the question of whether the farmers were entitled to farm-saved seeds stipulated under Section 39. The Authority emphasized that the Act gives primacy to farmers' rights instead of breeders, thus allowing for farm-saved seeds. Furthermore, given the existing variety within the public domain, farmers are not liable for any infringement. Implementing PPVFRA has revolutionized the Indian agricultural landscape by offering novel prospects for breeders and farmers. Nevertheless, the Indian seeds sector poses unique challenges for breeders seeking to enter the market, as the industry's operational framework differs significantly from that of developed countries.[55] In an attempt to revamp the seed regime and supplement the PPVFR Act, which was inclined in favour of farmers, the Seeds Bill 2004 was drafted to create a parallel regime offering protection for the rights of the seed industry.

***SEEDS BILL, 2004*:**

The proposed Bill aimed to establish a reliable system for supplying high-quality seeds and planting materials to farmers. Unfortunately, the legislation was not passed by Parliament, so the implementation of this critical initiative was postponed indefinitely. It aimed to establish a Central Seed Committee, which would appoint subcommittees to maintain a national register of seeds. The registration of transgenic seed varieties was prohibited without clearance under

[52] PROTECTION OF PLANT VARIETIES AND FARMER'S RIGHT AUTHORITY, https://plantauthority.gov.in/sites/default/files/final-judgment-fl-2027-dated-3rd-dac-2021.pdf (last visited Dec.12, 2023).
[53] *Id.* at 2.
[54] 2023 SCC OnLine Del 3912.
[55] Robyn Ott, *Protection of Plant Varieties and the Farmer's Rights Act*, 2 Okla. J.L. & Tech. 1 (2004-2005).

the Environment Protection Act of 1986. Seed sellers could register their seeds with a certified agency, but nurseries must be registered with the state government. The Bill introduced the concept of seed certification and protected farmers' rights to sow, use, and sell exchange farm seeds, subject to a ban on commercial utilization. Seeds sold had to adhere to prescribed standards of germination, genetic purity, and physical purity. The seed producer, vendor, and manufacturer were required to disclose the seed's expected performance under given conditions, and farmers could claim compensation under the Consumer Protection Act of 1986 if the seed failed to perform. The central government was to establish a Central Seed to advice on seed planning, development, registration standards, and import and export of seeds. State governments were to establish State Seed Committees to advice on matters such as seed registration for local seeds, dealers, and producers. The Bill contained strict provisions for fines for contravention of the Act's provisions. Prima facie, the bill was flawed and failed to consider the practical realities of farming. Requiring compulsory registration of seeds and prohibiting the sale of unregistered ones would have had the unintended consequence of limiting the circulation of farmers' varieties in the formal seed market. This would have given an unfair advantage to the seed industry, separating seed production from farm production and making farmers utterly dependent on seed companies. Instead, the Bill should have focused on improving accessibility and availability of safe and high-quality seeds, rather than just providing a regulatory mechanism to facilitate their production, supply, and sale.[56] Following the criticism and opposition from political parties, farmer organizations, and civil society, the Seeds Bill 2004 underwent scrutiny by the Standing Committee. The committee recommended that the PPVFRA be made fully functional before the enactment of Seeds Bill, 2004. Moreover, it suggested that the public sector should receive encouragement without being marginalized by commercial gains, and price regulatory provisions should be included to safeguard farmers from arbitrary pricing. The committee also recommended implementing stringent penal provisions to regulate the powers of seed inspectors and prevent abuse, reducing the registration period from 15 to 10 years for annual crops and 18 to 12 years for perennial crops. Furthermore, the committee advised that the Act should include provisions for compensation, and the term "farmer" should be expanded to include individuals who preserve and conserve traditional varieties of seeds.[57] As a result, the government came up with the Draft Seeds Bill,

[56] K. M. Gopakumar & Sanjeev Saxena, Seeds Bill 2004: For Whom?, 47, 4, Journal of the Indian Law Institute ,483-501,(2005).
[57] Standing Committee on Agriculture (2006-07), 22nd Report, 14th Lok Sabha.

2019, which incorporated the various suggestions and recommendations from the Standing Committee.

SEEDS BILL, 2019:

The Seeds Bill 2019 is a crucial intervention to ensure the provision of cutting-edge seed technology to farms, thereby maximizing productivity and profitability. The Bill proposes the establishment of a central seed committee following the 2004 bill. One of the most significant features of the Bill is the provision of differentiated definitions for seed processors, seed dealers, and seed producers for licensing purposes. As per the Bill, all seeds must be registered and conform to the prescribed standard of germination physical and genetic purity. In addition, the registration of transgenic seeds requires clearance under the Environment Protection Act 1986. The Bill introduces a new concept of truthfully labeled seeds with voluntary registration. Furthermore, the central government has the authority to fix the price of seeds in emergencies such as market price fluctuations, short supply, monopolistic pricing, and profiteering. This provision is noteworthy, as in 2006, seeds were excluded from the definition of essential commodity under the Essential Commodities Act, 1955. The Bill exempts farmers from compulsory registration of the varieties they have developed. However, if a farmer sells these varieties for monetary consideration, the sale must be registered. The Seeds Bill 2019 addresses several crucial issues missing in previous seed legislation. However, scholars and activists are concerned that the current legal regime precedes corporate control over the seed sector. Such control over the first link of the food system affects not only our seed sovereignty but also our national sovereignty.[58] Back in 2006, the arbitrary pricing of Bt-cotton by Mahyco-Monsanto Biotech raised concerns for the Andhra Pradesh government, ultimately leading to the implementing of a government-imposed price control system. One of the primary challenges with such imposed pricing is that it can impede the investments made by Agri-biotech companies in research. Government policies need to strike a balance in this regard.[59] Seed

[58] Milind Murugkar, Bharat Ramaswamiet.al, *Competition and Monopoly in Indian Cotton Seed Market Source,* 42, 37, Economic and Political Weekly , (2007), https://www.jstor.org/stable/40276397.

[59] The price of Bt-cotton seeds was Rs 1600 for 450 grams. The government of Andhra Pradesh considered this to be monopolistic trade practices with unreasonably high prices and limited technical developments. n May 11, 2006, In response to the MRTPC Act imposed by the state of Andhra Pradesh, Mahyco-Monsanto Biotech reduced the price for Bt cotton hybrids from Rs 1,600 to Rs 1,200. The government of Andhra Pradesh felt that this was still too high a price and proclaimed an ordinance declaring that the prices for Bt-cotton seeds in the state would be capped at Rs 750. MMB, however, argued that the technology fee being charged was not for the sale of any goods, but for the transfer of knowledge to sub-licensees see Anchal Arora & Sangeeta Bansal , *Diffusion of Bt Cotton in India: Impact of Seed Prices and Varietal Approval Source,* 34,1,Applied Economic Perspectives and Policy, 102-118,(Oxford University Press, 2012).

governance has recently been a topic of concern, with industrial seeds being deemed climate-unfriendly and responsible for increasing toxicity of land water consumption. In contrast, farm-produced seeds have been identified as more nutritious, climate-resilient, and water-conserving, promoting sustainable agriculture. Farm-produced seeds still account for approximately 50% of the cropped area, making them crucial in securing farmers' sovereignty rights and promoting chemical-free agriculture. However, the definition of farmers has undergone significant changes, resulting in the inclusion of large corporate entities as farmers and undermining the livelihoods of traditional farmers. Additionally, classifying seeds into national and state seed varieties seems unscientific and not based on agro-climatic zones or seed traits, contradicting the previous classification system. The introduction of "synthetic seed" and transgenic seeds, despite prior failures such as BT cotton, may further open the floodgates for Genetically Modified seeds. Furthermore, the present regime has the potential to undermine the federal structure of seed governance, as the central seed committee no longer has representatives from each state. The current Seeds Bill also fails to compensate farmers and requires them to claim compensation from consumer courts, leading to a lack of harmonization with the PPVFRA. The concurrent existence of different dispute resolution forums will create a multiplicity of suits and confusion rather than providing an appropriate resolution of the problems.[60]

III. CONCLUSION & RECOMMENDATION

Achieving food and nutritional security, along with economic development, requires sustained efforts to boost agricultural productivity, especially as cultivable land declines. Seed quality is central to this, as it influences the effectiveness of all other inputs. Continuous development of improved crop varieties and a robust seed production and distribution system are vital. Affordability of high-quality seeds, particularly hybrids, must be ensured through price regulation. Community seed banks can reduce market dependence and safeguard crop diversity. Stronger regulations are needed to prevent spurious seed sales, including mandatory labeling of seed traits and holding suppliers accountable for poor performance. Rapid seed testing at the point of sale should also be implemented. Public research must be prioritized to overcome slow varietal development caused by limited private patent rights. A balance between private intellectual property and public access is essential. Finally, increasing the use

[60] Srividhya Ragavan & Jamie Mayer O'Shields, *Has India Addressed Its Farmers' Woes - A Story of Plant Protection Issues,* 20 GEO. Int'l Envtl. L. Rev. 126 (2007).

of certified seeds over farm-saved ones, especially in pulse cultivation, is critical for long-term productivity. The effectiveness of Plant Variety Protection is more pronounced in countries like the US, where public plant breeding budgets have been scaled back, and the practice of "farmers' privilege" has been curtailed, limiting the use of seeds solely for personal use and preventing their distribution to other farmers. This approach can be particularly advantageous in economies where the agricultural sector contributes only a small percentage to the GDP and labour force.[61]

Truthfully labelled seeds require both breeder and parental seed lines. However, research institutions and private companies control these lines, making it difficult for small private companies and farmer-producer organizations to access them for seed production. An open-source platform for sourcing parental seed material is needed to promote innovation and increase the number of seed varieties available in the market. Additionally, quality seeds must be available in local markets at least three years before planting, with plans to meet changing varietal preferences. Liability must also be established if the supplier fails to provide the seeds on time. High germination rates and genetic purity are crucial to ensure farmers' profitability. Unfortunately, spurious seeds remain a concern despite government control of certification agencies. Participatory guarantee certification of cluster formations ranging from 25-50 acres should be encouraged to address this issue. [62]

Implementing these measures will significantly enhance competition in the seed market while incentivizing the supply of quality seeds to remote and underdeveloped areas to improve farmers' profitability and double their income. It is disheartening that in a nation like India, where the economy, society, and cultural heritage are rooted in agriculture, the regulation of one of the primary necessities for food security and livelihood - 'seeds' - is governed by legislation that was enacted over five decades ago when the sector was in its infancy. With the introduction of biotechnology in transgenic and hybrid seeds, the farming industry has undergone a significant transformation, necessitating progressive seed legislation in India. Without such legislation, the goal of doubling farmers' income and achieving a five trillion dollar economy will remain an unrealized distant dream. In the end, one should not forget what

[61] *Supra* note 31.
[62] **Amarender Reddy,** *Creating seed systems*, 53, 11, Economic and Political Weekly, (Mar. 17, 2018) https://www.epw.in/journal/2018/11/letters/create-seed-systems.html.

Mahatma Gandhi once remarked, "India lives in villages, and agriculture is the soul of the Indian economy."