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TITLE: ANALYSING THE PLANT VARIETY PROTECTION WITH RESPECT TO FOOD SECURITY IN INDIAN CONTEXT

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ANALYSING THE PLANT VARIETY PROTECTION WITH RESPECT TO FOOD SECURITY IN INDIAN CONTEXT

By Kishan Sharma[1]

Abstract

Ending hunger, achieving food security and sustainable agriculture is the second Sustainable Development Goal (SDG) out of seventeen SDGs of United Nations and it aims to ensure food security and nutrition to each individual globally. Plant varieties protection (PVP)and plant breeders' rights protection agreements and laws like International Union for the Protection of New varieties of Plant (UPOV), TRIPS Article 27.3(b) and Protection of Plant Varieties and Farmers' Act, 2001 provides for the protection of new and efficient plant varieties which can also help in achieving goal of zero hunger. New and efficient plant varieties have been huge help for increased agricultural production globally and have helped in combating food insecurity in India. In this paper author has tried to analyse various initiatives of plant variety protection by private and public bodies and their effect on food security in India in the last decade.

Keywords: Plant Varieties, Seeds, food security, hybrid.

Research Questions

1. Whether private investment in development of newer plant varieties and their protection have helped strengthening food security goals?
2. Whether food security goals can be achieved by providing more protection to newer plant varieties or a more welfare centric approach is to be adopted?

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1. INTRODUCTION: RELATION BETWEEN FOOD SECURITY AND PROTECTION OF PLANT VARIETIES AND BREEDERS' RIGHTS

In September 2015, United Nations General Assembly adopted "2030 Agenda for Sustainable Development"[2] which had 17 SDGs to be achieved by the end of year 2030 for the better

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future of people and nations globally. These SDGs are in the increasing order of their importance and out of these 17 SDGs; "ending hunger, achieving food security and sustainable agriculture" is at second place after the goal of eradicating world poverty, this indicates the pressing need of food security all over the globe and especially in least developed and less developed countries where agriculture is not sustainable. Increasing population and decreasing agricultural lands due to urbanisation has made it important that the production of agricultural produce is increased to meet the requirement along with the development of pest resistant seeds.

This 2nd SDG has 8 targets within it and out of which some are worth mentioning here which are directly associated and can be achieved by the help of protection of plant varieties and breeders' rights[3] and those targets are; doubling the agricultural productivity, developing sustainable food production and resilient agricultural practices, maintaining the genetic diversity of seeds and increasing investment in agricultural research.[4]

According to FAO and World Bank, food security is analysed by four indicators that are; availability, access, utilization and stability.[5]Availability means the supply of the food and whether the food is physically available and produced. Access means the physical and economic access to the available food. Utilization refers to the ability to derive best possible and required nutrition from the food available biologically and having diversity in food and seeing whether people are having required intake of nutritious food.[6] Food security is not a linear aspect but rather it is an interconnected aspect of food production, social and economic factors of a region, family's' economic condition and global factors like war and natural calamities and analysing food security should be done by holistic lens which is usually done by the reports of agricultural research departments. However the primary focus of this paper is related to PVP and its effect in driving towards the goal of food security.

Availability aspect is looked by analysing the production and yields of the agricultural produce and this is where high performing seeds developed by breeders come into picture as they help in boosting and maximising the yields as it is shown and mentioned by various

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[2] Ann Raeboline Lincy Eliazer Nelson, Kavitha Ravichandran & Usha Antony, *The Impact of the Green Revolution on Indigenous Crops of India*, 6 J. ETHN. FOOD 8 (2019).
[3]Graham Dutfield, *The Role of the International Union for the Protection of New Varieties of Plants (UPOV)*.
[4]*Id.*
[5]What is Food Security? There are Four Dimensions, https://www.worldbank.org/en/topic/agriculture/brief/food-security-update/what-is-food-security (last visited May 14, 2023).
[6] Id.

reports for example in a recent report[7] by NABARD which showed that India is still lagging behind the average global production levels of rice and wheat. Since production is directly proportionate to availability of food, it is the best factor to be analysed. And it is mentioned in the above-mentioned report that India could fill the gap in the production and reach the global average production by embracing hybrid seeds in the agriculture. ICAR is also instead of developing high yielding crop seeds, is focusing on developing resilient seeds t tackle climate change.[8]

The development of high yielding varieties and resilient crops can be promoted well only if the rights of plant breeders are secured and they could get returns on their investments. This was foreseen by many nations and as a result they adopted the International Union for the Protection of New varieties of Plants (UPOV) in 1961, 1978 and 1991 which talks about *sui generis* legislation for the protection of plant breeders' rights.[9] So a good PVP can induce the development of resilient and high yielding seeds which can surely promote higher yields and there have been many reports and studies which show that the yields exponentially increased in countries like France and USA in categories of wheat and corn respectively.[10] WIPO also advocates that a good PVP can be beneficial for the private businesses.[11]

India therefore due to TRIPs mandate as per article 27(3)(b), came up with a *sui generis* legislation for the protection of plant varieties called Protection of Plant Varieties and Farmers' Rights Act, 2001(PPVFRA) on the lines of UPOV convention system which aims at harmonizing the PVP legislations at international levels.[12]

It is therefore important and interesting to see the effects and changes in the agricultural production brought by the development of new and efficient seeds which have supported the goal of food security in India. And it is also important to see whether increased private

[7]Department of Economic Analysis and Research, *Food and Nutritional Security in India, (November 2022)* https://www.nabard.org/auth/writereaddata/tender/2501230131nrs-35-food-and-nutritional-security-in-india.pdf (last visited Apr 20, 2023).

[8]PM Modi releases climate resilient crop varieties: How will they help India | Latest News India - Hindustan Times, https://www.hindustantimes.com/india-news/pm-modi-releases-climate-resilient-crop-varieties-how-will-they-help-india-101632817619148.html (last visited Apr 20, 2023).

[9] INTERNATIONAL CONVENTION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS (UPOV).

[10]Benefits of Plant Variety Protection, https://www.wipo.int/wipo_magazine/en/2010/03/article_0007.html (last visited Apr 28, 2023).

[11]How SMEs can Benefit from Plant Variety Protection, https://www.wipo.int/ipoutreach/en/ipday/2021/toptips/upov.html (last visited Apr 20, 2023).

[12]IP/C/W/347/Add.3, available at https://docs.wto.org/dol2fe/Pages/FE_Search/FE_S_S009-DP.aspx?language=E&CatalogueIdList=5100,62067,31006,66043,40823,49396,35644,25697&CurrentCatalogueIdIndex=3&FullTextHash=&HasEnglishRecord=True&HasFrenchRecord=True&HasSpanishRecord=True

investment if any in seed development is furthering the cause of eradicating hunger and providing nutritious food.

2. PRIVATE AND PUBLIC INVESTMENTS IN DEVELOPMENT AND PROTECTION OF NEW AND EFFICIENT PLANT VARIETIES AND THEIR POSSIBLE EFFECTS ON FOOD SECURITY IN INDIA.

2.1 Private Investment in Development of Plant Varieties

Up until 2021, 40 percent of all the certificates allotted to the registered varieties, 40 per cent were allotted to private breeders and 29 per cent to the farmers and the rest 23 percent and 8 percent to the public bodies like Indian Council for Agriculture Research (ICAR) and State Agriculture Universities respectively.[13] This shows the extensive research and development of plant varieties for the purpose of agriculture being carried out by the private entities. After the enactment of PPV&FR Act, 2001 private research and development of seeds increased and many private players entered the market. Staple crops however saw low Seed Replacement Ratio (SRR) as compared to vegetables. And therefore according to data available, this SRR has to be improved so that the demand and consumption of quality seeds by the farmers can be increased leading to more profits for the seed companies and thus encouraging more and more production and research in the field of seeds.[14] However most of the seeds produced by the private companies are licensed from the ICAR and there are in fact very few companies in India that are engaged in development and production of newer varieties of seeds and hybrid seeds. Apart from increasing and harmonising the uneven SRR in the different states, it is also important to stop the use of old seeds which are not as efficient as compared to other quality seeds. Also, the newer seeds are not produced thus leaving the old and poor-quality seeds still in circulation.[15]However the report of NABARD[16]

[13]Data: Of the Certificates issued by the Plant Authority, 40% issued to Farmers & 29% to Private organizations, FACTLY (2021), https://factly.in/data-of-the-certificates-issued-by-the-plant-authority-40-issued-to-farmers-29-to-private-organizations/ (last visited Apr 30, 2023).

[14]Indian Seed Industry – Nuziveeduseeds, https://nuziveeduseeds.com/indian-seed-industry/ (last visited Apr 30, 2023).

[15]PB10-Harmonization of seed regulations for sustainable food security.pdf, http://naas.org.in/Policy%20Briefs/PB10-Harmonization%20of%20seed%20regulations%20for%20sustainable%20food%20security.pdf (last visited Apr 30, 2023).

recommends that to increase the grain production, it is important to use and promote the usage of hybrid seeds in agriculture. If above problems are addressed properly it would amount to increased usage of hybrid seeds and further encouragement of private sector seed companies and their establishment in India.

2.2 Proper regulation and governance can lead to better results

Recently PepsiCo lost its registration[17] of potato variety due to inaccurate documentation but this issue was raised in the first place as the PepsiCo sued some potato farmers for using PepsiCo's registered variety without permission, however it overlooked the provision of farmers' rights under PPV&FR Act, 2001 which allows the farmers to save, sow and sell the seeds or genetic material of a protected variety. However, farmers can only sell without branding/labelling it as the name of the protected variety. This whole scenario shows us the lax regulation and governance in the field of seed regulation and quality regulation. One more case of such poor quality control and implementation of laws were seen in the case of bt – cotton case in Maharashtra which was advertised as pest resistant but failed as the pests developed resistance and outburst of new different variety of pests.[18]That is the reason why GM crops are not allowed in India as their reliability is marred by such incidents.[19] GM mustard and GM brinjal crops are therefore still stuck in the testing and research phase and yet to launch in India. It is better to test the seeds before wide spread launch as these seeds might lead to pest resistance or creation of new pests in the long run. Spurious seeds also are the cause of crop failures.[20]

Such cases lead to the mistrust in the market regarding the seeds' quality and bring a bad name to the technology itself and thus creating an air of confusion among the farmers.

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[16]https://www.nabard.org/auth/writereaddata/tender/2501230131nrs-35-food-and-nutritional-security-in-india.pdf.

[17]PUBLIC NOTICE 19 OF 2021 -ORDER DATED 3rd DECEMBER, 2021 OF LD. CHAIRPERSON - REVOCATION OF FL 2027 POTATO VARIETY REGISTERED IN FAVOUR OF PEPSICO INDIA HOLDINGS PRIVATE LIMITED | Official website of Protection of Plant Varieties and Farmers' Rights Authority, Ministry of Agriculture and Farmers Welfare, https://plantauthority.gov.in/public-notice-19-2021-order-dated-3rd-december-2021-ld-chairperson-revocation-fl-2027-potato-variety (last visited Apr 30, 2023).

[18]Is Bt cotton a success or failure?, https://www.downtoearth.org.in/news/is-bt-cotton-a-success-or-failure-38417 (last visited Apr 30, 2023).

[19]The Failure of GMO Bt cotton and the continued success of Native Indigenous Cotton in India, NAVDANYA INTERNATIONAL (Jul. 20, 2022), https://navdanyainternational.org/the-failure-of-gmo-bt-cotton-and-the-continued-success-of-native-indigenous-cotton-in-india/ (last visited Apr 30, 2023).

[20]Punjab: Cotton season here, so are spurious seeds, THE TIMES OF INDIA, Apr. 24, 2022, https://timesofindia.indiatimes.com/city/amritsar/cotton-season-here-so-are-spurious-seeds/articleshow/91040628.cms (last visited Apr 30, 2023).

There's also a pressing need for the sensitisation and awareness of the farmers regarding the correct usage of seeds and their verification of seed's origin and quality.

More private seed research and investment in India can only be brought if proper implementation of IP laws and quality control of seeds is achieved along with addressing other issues as mentioned already above.

2.3 Diversity

Another important and pressing issue connected with hybrid and GM seeds are the eradication of local or indigenous variety of seeds and this leads to lack of diversity in the crops. Agricultural bio-diversity is important as it prepare the farmers against climate change. If all farmers grow same species of plants, then they are more susceptible to climate change and mass losses. However, if there is diversity in crops and type of seeds in the same crop, then even if one crop fails, the other crops can minimise or absorb the losses. It is also necessary for nation's food security that proper policies and regulations are in place to check the diversity as failure of one type of crop may lead to food scarcity if other types of crops are not grown simultaneously. Same was faced by agriculturist in Maharashtra when their crops of BT –cotton failed as majority of the farmers were growing same crop. Had there been diversity in cotton crops for example farming of indigenous crops, the losses could have been less.[21] Diversity has multi fold benefits like new markets, climate change resilience and nutrition benefits.[22] Diversity is also one of the targets of second SDG in achieving food security as the diverse foods lead to holistic nutritious diet and secure and sustainable farming.

It is therefore a necessity to develop more and more different type of seeds in different type of crops, even in those crops which are not considered to be profitable due to their climate change prone nature. Millets and vegetables are therefore coming up as newer form of crops which are being appreciated by the farmers as there are various hybrid seeds of vegetables and millets which are resulting in profitable cultivation. Still the development of seeds of other type of crops apart from cereals is way too less and there is always a potential for

[21] Supra note 19.

[22] Diversity | Agroecology Knowledge Hub | Food and Agriculture Organization of the United Nations, http://www.fao.org/agroecology/knowledge/10-elements/diversity/en/?page=6&ipp=5&tx_dynalist_pi1%5Bpar%5D=YToxOntzOjE6IkwiO3M6MToiMCI7fQ%3D%3D (last visited Apr 30, 2023).

growth. Especially for public sectors in vegetable seed research, because most of the quality seeds are developed by private entities in India and governmental agencies like ICAR is behind in such areas.[23]

2.4 Nutrition/ Utilization/Diversity/Millets

Indian agriculture changed drastically with the progress of hybrid seeds and their use in the Indian agriculture sector due to the raging green revolution in India in early 1960s and after. Millets' consumption thus declined to 5% from 35% and 3% from 17% in rural and urban households respectively, but production increased due to higher yields and better agro infrastructure development in India.[24]This led to increase in the production of grain like wheat and rice, however many indigenous crops like millets got almost left behind and this led to serious nutrition deficit in Indian population and diversity in crops which is essential for both nutrition and environment.[25] UN general assembly in 2021 also declared 2023 as International year for Millets by the proposal of India to spread awareness about the benefits of the millets, create demand and to provide nutritious food to global population. India is also a producer of around 20 percent of global millet production and Indian government in the National Conference of Kharif Campaign, 2022 launched and discussed various national level initiatives to boost the production, consumption and cultivation of millets in the nation.[26] Out of 5134 certificates of registered plant varieties, 3417 certificates were given to cereals and out of these 3417 varieties, only around 154 varieties (public varieties) of millets are registered from the year 2014-2023.[27]According to the data provided by India Development Review[28] India is in the top five producer of millet in the world and historically India's millet production has been increasing despite decline in area under cultivation of millets, which shows the increase in per hectare production of millets but still it is behind the per hectare

[23] Supra note 15.
[24]https://www.nabard.org/auth/writereaddata/tender/2501230131nrs-35-food-and-nutritional-security-in-india.pdf
[25]Eliazer Nelson, Ravichandran, and Antony, *supra* note 2.
[26] National Conference on Kharif Campaign, 2022, https://agricoop.nic.in/Documents/Crops_0.pdf (last visited Apr 20, 2023).
[27] Id.
[28]Millet cultivation in India: History and trends | IDR, INDIA DEVELOPMENT REVIEW, https://idronline.org/article/agriculture/millet-cultivation-history-and-trends/ (last visited Apr 30, 2023).

average of America as per the report of NABARD.[29] But still it has huge potential to come at par with the other cereals like wheat and rice. Indian government is consistent in the promotion (via various interactive sessions and schemes) of millet production among farmers as this year is declared as International Year of Millets, 2023. India has also increased the minimum support prices of millets which are a good way to boost the promotion and attracting farmers to grow millets. Haryana government also came up with a good initiative of rewarding the farmers for not growing water intensive crops like paddy and instead growing millets which are not water intensive and are indigenous to the land and are easily grown.[30] The mid-day meals now incorporate millets in their meals for nutritious intake.[31]

This shows that the development of high yield varieties of millets boosted the production and now due to the saturation in wheat and rice cultivation, it is a better option for farmers, nation as well as environment to increase the cultivation of millets.

3. CONCLUSION

It is clear that the seed research and development is increasing and private participation is now surpassing the public investments. It is estimated that the Indian seed industry will double its size by the year 2028[32] and therefore the mechanism to register and development of hybrid seeds must be smooth and fast. From the analysis of registered hybrid and varietal seeds, it can be said that unlike public investment which initially gave much needed impetus to the industry of seed development, now the helm is guarded and operated by private sector. Private sector is busy in developing high revenue generating seeds like rice, wheat and millets also it is the private sector which is increasingly developing vegetable varieties unlike public institutions which focus on basic staple crops. The problems however in increasing the hybrid seed production is from the demand side as the staples are already saturated by both public and private sector seeds, the nutrition intake is not increasing and this led the Indian government to promote the millets as an alternative crop so that millets can be used for

[29] https://www.nabard.org/auth/writereaddata/tender/2501230131nrs-35-food-and-nutritional-security-in-india.pdf.

[30] Craze for millets growing but farmers still not enthused by the prospect, THE TIMES OF INDIA, Aug. 29, 2022, https://timesofindia.indiatimes.com/india/craze-for-millets-growing-but-farmers-still-not-enthused-by-the-prospect/articleshow/93845156.cms (last visited Apr 30, 2023).

[31] Govt introducing millets in Mid-Day Meal Scheme | DD News, https://ddnews.gov.in/national/govt-introducing-millets-mid-day-meal-scheme (last visited May 14, 2023).

[32] Seed Industry in India | Share, Size, Growth, Trends and Forecast 2023-2028, https://www.imarcgroup.com/seed-industry-in-india (last visited May 14, 2023).

nutrition which India forgot in its diet since the green revolution. Millet seeds production has seen increased research investment by the private sector. However, the awareness to sow the millets is to be spread. Government also increased MSP in some states to induce millet production. This initiative can be instrumental for Indian food security both in terms of nutrition as well as diversity.

Unlike US and other countries Indian does not use GM crops which have shown tremendous results in other countries. In Maharashtra, some farmers are revolting by growing banned Bt-cotton crops. This shows that the farmers are desperate to increase their revenues using bt cotton crops, and this raises concern as it can affect the environment as well as gm crops can affect the diversity of the land. It is important to govern and regulate this area. India has already banned many gm crops[33] but these gm seeds make their way in India via leaky borders.[34][35] Indian seed companies also need to spread awareness about stoppage of using old seeds and newer varieties of seeds so that the stock of new seeds can be utilized. It is also important to increase the SRR to increase the demand of sowing seeds. All these are directly related to food security and more investment in private sector is only going to bring us closer to that goal. Increased production by hybrids, diverse cultivation via millets which increases nutrition and millet production increased by hybrids are all interrelated and food security and plant varieties development go hand in hand. GM crops are thus not needed in India as there are already many seeds which are fulfilling the demands. Indigenous seeds have also shown the resilience against gm crops; thus, diversity is undeniably essential in this pursuit of food security.

[33] BAN on GM CROPS, https://pib.gov.in/newsite/PrintRelease.aspx?relid=191120. (last visited May 14, 2023).

[34] After terror, Bangladesh sends Bt seeds into India, HINDUSTAN TIMES (2014), https://www.hindustantimes.com/india/after-terror-bangladesh-sends-bt-seeds-into-india/story-WCd8KQZeJkwlmCIc1GCLjJ.html (last visited May 14, 2023).

[35] Indian farmers can't wait anymore, they are sowing seeds of GM crops one Bt brinjal at a time, https://theprint.in/opinion/indian-farmers-cant-wait-anymore-they-are-sowing-seeds-of-gm-crops-one-bt-brinjal-at-a-time/502675/ (last visited May 14, 2023).