

A Critical Re-engagement with Traditions: Women, Agriculture and Agroecology in India

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Abstract

This paper seeks to analyse the erosion of seed sovereignty over the past five decades in light of green revolution and modernisation of Indian agriculture with reference to its impact on smallholders in the country, a majority of whom are women. In India and in most part of the Global South, women farmers have played a distinct role as seed saver and crop diversity manager. The loss of control on seed and farming in new global agricultural regime led by agribusiness not only undermines their role in agricultural production, but also raises issues about farmer's autonomy and food security. Additionally, there are questions about overuse of land and water resources, health problems, environmental trade-off, sustainability of modern agricultural systems. This article proposes that the agroecological traditions, already practiced by women in the farming communities in India, emerges as a viable alternative recourse to petro-based, resource guzzling agriculture as they help in diversifying the crops and incomes while also providing women an agency. It is in this sense that a re-engagement with traditions in farming may help conceptualise a democratic framework for agriculture in which women farmers remain at the centre of seed and crop management

Keywords: agroecology, farming traditions, agriculture, seed policies, women farmers.

Introduction

Women farmers have played a crucial role in agriculture in India and in most of South Asia since the antiquities. A majority of women farmers are small and marginal, under-resourced, engaged in subsistence farming, yet they produce the most diverse crops through a variety of sustainable cropping methods. They have been the doyens of farming, being central to the food production in the Indian agricultural system with their involvement at every stage of production. In this process they acquire specific skills and knowledge of farming, especially pertaining to

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seed. Women have played a crucial role in seed saving, grain storage, seed selection and in this capacity, they have been the custodians of indigenous knowledge systems associated with these practices. Because of their multiple roles as farmers, gardeners, cooks, keepers of culinary traditions, women have been curating seeds and have maintained agrodiversity (Pionetti, 2005). However, over the past five decades, seeds have slipped away from farmers control and have become propriety of breeders, genetic engineers, registered seed dealers and agribusiness who regulate the seeds in the contemporary times (Shiva, 1993; Pionetti, 2005; Peschard, 2017). There is increasing technical control in seeds to achieve economic efficiency in the form of higher yield. The rapid commercialisation and corporatisation of seeds aided by trade liberalisation and intellectual property rights not only undermines women's role as seed saver but also pose serious challenges to the erosion of seed sovereignty of the farmers.

This very process of erosion of seed sovereignty and the parallel loss of agrobiodiversity in wake of productionist technology such as green revolution and agribiotechnology and its specific implication on women seed savers is explored in this article. Seed policies further entrenched the shift in Indian agriculture making it centralised, market dependent, externally-driven. To a great extent, the genesis of current agrarian distress can be traced to the political and economic foundations of modern agrarian arrangements. Discourse analysis of legislations explicates how the vision of agriculture of the country is deeply informed by productionism. In other words, the larger scheme of agricultural development believes that increasing production is the solution to all problems.

The article is structured in three sections: The first section traces the legacy of seed legislations of colonial and post-colonial India in a historical perspective to demonstrate how agricultural narrative is a continuum. The second section will discuss the seed legislations in contemporary India, specifically to assess the impact of trade liberalisation on seed savers. The third section discusses the conceptualisation of a democratic framework for seed governance keeping women farmers at the centre of seed management.

Research Design

This article foregrounds the subsequent erosion of seed sovereignty in the process of agricultural modernisation as observed in the field study in five districts in Odisha conducted in 2018 by the author namely-Nayagarh, Ganjam, Bargarh, Sambalpur and Sundargarh. These field sites were selected based on the prominent role of some voluntary organisations working to revive agroecological farming traditions. The information generated from the interviews and discussions with 30 farmers and four seed saving network coordinators were interpreted in light of the seed policies in India. While field explorations reflected the lived realities of farmers and farming, the policy analysis demonstrates how change in the international climate on intellectual property rights (IPRs) and trade liberalisations have eventually dovetailed into a seed regime monopolised by the global agro-industrial complex in which farmers have lost the control of seed and crop management. Because of women's role of being the seed custodian, the emergent exclusionary regime of seed impacts them in very specific ways as reported by the women from in their interviews. A closer look at historiography of the policies enables mapping the breaks and continuities in the policy conundrum and will evince the objectives by which agricultural policy on seed have been guided so far. The discussion would highlight if the policies subsequently gravitated towards progressive commodification of seeds, having severe implications for sustainable food and farming. In the end article would discuss how agroecology with women in the central role offers a sustainable alternative, that would possibly democratise the discourse of agriculture.

Literature Review

There are crucial works that provide a foundational understanding on this subject matter. To begin with, Akhil Gupta (1998) and Ashutosh Varshney (1998) exhibit the wider politics and political economy of agrarian transformation in India. The gender dimension of the effects of agricultural modernisation is discussed by Bina Agarwal (2016) and Vandana Shiva (1988, 1993). These works showcase how the consolidation of industrial agriculture and private seed industry has systematically eroded women's control over food and farming, not to

mention the associated environmental trade-off. Based on her extensive field study of South India, Carine Pionetti (2006) offers substantive insights into how women farmers individually as well as in communities are resisting this agribusiness-corporate takeover. They struggle for their farming autonomy in order to retrieve their agency through local seed networks in the Deccan Plateau of India. Seed policy analysis by Suman Sahai (1994, 2005), Shalini Butani (2015) and Ian Scoones (2002) depict that state, through its regulatory policies, has been the most decisive factor shaping the agricultural discourse till 1980s. However, this changed with India signing the Trade-Related Aspects of Intellectual Property Rights of Agreement (TRIPs) in 1994 leading to trade liberalisation and consolidation of commercial-corporatist agricultural regimes.

In order to get a complete picture of these developments, it is pertinent to trace the legacy of seed legislations in India.

I. Legislation on Seeds in a Historical Perspective: Colonial and Post-colonial India

As discussed in the preceding section, seed policies of colonial and contemporary times will reveal the politics and political economy of transformation of the seed. The seed sector was marked by strong presence of the state and the public sector till 1980s, however, later witnessed their withdrawal due to rapid ascendance and take over by the private sector.

The agricultural policies of British India were aimed at maximization of profit and hence, they mostly focused on revenue and property laws. In this period, there was no separate legislation on seed. Guided by the urgency to increase the revenue, the colonial administration introduced several new measures like the policy of land revenue settlements beginning with the Permanent Settlement of 1792. They imposed intensive cultivation of cash crops like jute, indigo, cotton, sugar, tea, coffee for export purposes. Development of railways and road transportation enabled expansion of the cash crop to be exported to national and international markets resulting in commercialisation of Indian agriculture (Washbrook, 1994). The colonial administration also

created 'Department of Revenue, Agriculture and Commerce' in 1871 with the aim of ensuring the timely supply of cotton to the textile industry located in Manchester, United Kingdom. Colonial policies resulted in farmers entangled in the matrix of inequality and exploitative relations among peasants, landlords, moneylenders causing considerable distress (Klein, 2008). They not only caused the indebtedness of the farmers but also led to ecological imbalances and famines (Whitcombe, 1972).

Though the British administration did not formulate a clear policy on seeds, yet it intervened in the seed markets by installing a system of testing and developing new varieties of seeds with higher yields and distributing them to farmers through extension (Pray and Ramaswami, 2001). New improved seeds were imported from the US and Europe as early as the 1850s, and introduced in various regions of India. For example, New Orleans cottonseed was introduced in Banda district in 1861 and Carolina rice seed was introduced in Northern Western Province in 1869 (Singh, 1982). To carry on the research on these seeds, model farms were created in Allahabad, Bulandshaher and Kanpur, but they could not succeed in their endeavours in absence of supervision by a responsible authority. Aiming to raise the export of cash crops, the Government tried to persuade the cultivators to adopt the new seeds however, they were not adopted by farmers largely. The crop research also started in colonial India, though in a very limited sense, and the initiative covered cash crops like cotton rather than food grains (Roy, 2007).

Post-colonial India inherited the debilitated economy of the colonial state. For an agrarian country, agriculture was seen as the only way to salvage the society from rampant poverty, malnutrition and chronic underdevelopment. Hence, agriculture was identified as a foundational tool of development and a number of initiatives were adopted in the first decade after independence to improve agricultural production, the Grow More Food Programme being the significant one. Under this programme, new improved varieties of seed, fertilizers, drilling of wells, loans to farmers were introduced with an aim of attaining food-sufficiency (GOI, Report of the Grow More Food Enquiry Committee, 1952). However, due to limited resources of the post-colonial state and the ambivalence of state policies, this programme came to be perceived as a failed project at its end in 1952 (Sherman, 2013). After this, the government directly took the charge of modernising agriculture by giving it a place of primacy in

the planned economy of India with a substantial outlay of 15.1 per cent in the First Five Year Plan (GOI, First Five-Year Plan 1956-61).

The Government of India in alliance with the U.S. State Department and its philanthropic organisations like the Ford Foundation and the Rockefeller Foundation implemented a variety of measures for agricultural development that culminated in the green revolution in the 1960s. This was operationalised through the meticulous efforts in seed improvement by the national agricultural research systems (NARS), particularly Indian Council of Agricultural Research (ICAR) and Indian Agricultural Research Institute (IARI). The modern improved varieties of seed such as high responsive rice and wheat varieties were multiplied by the state seed farms and distributed to farmers through official agencies (Rao, 2004). Resultant sharp rise in grain production led to huge surge in demand for quality seeds of hybrid high yielding varieties (HYVs). To produce and market quality seeds, National Seed Corporation (NSC) was established in 1963 and to regulate seed sector, the first systematic seed policy in form of the 'Seed Act 1966' was enacted. The objective of this Act was to monitor the quality of notified seed sold for agricultural purposes through compulsory certification and voluntary labelling. The process of new plant breeding and HYVs production remained dominated by the public sector institutions through the 1960s and 1970s.

II. Trade Liberalisation and Seed Regulation: Impact on Women Farmers and Seed Savers

Despite huge investments and overarching paraphernalia of institutions in the 1970s, it was felt that the public sector in India was performing well below its capacity. Concerns about the efficiency of the public sector started moulding the discourse slowly in favour of the private sector. Whereas there were external pressures from sources like the World Bank that wanted the government to make space for rapid privatisation by 1980s, on the other hand there were internal pressure from Seed Association of India (SAI) (representing the interest of the upcoming private seed industry) for removal of trade barriers. The generous funding for the National Seed Programme (NSP) (1975-85) from the World Bank arrived only at the conditionality of enlargement of the private sector and downsizing the public sector's role in agriculture.

Unambiguously, the objective was to prepare the Indian seed market for its participation in the globalised seed market and its eventual assimilation in it (Jafri, 2018). Meanwhile, the government was also looking forward to the idea of inviting investments and collaborations with the companies abroad.

However, these imminent shifts required substantial changes in the policies. New Policy on Seed Development 1988 was adopted for greater liberalisation of the seed sector. Under this, the government introduced measures for reducing trade barriers on import of new agricultural technology, allowing entry of foreign firms and incentivising large Indian corporations in the seed sector (Pray and Bharat Ramaswami, 2001). For example, quick approvals were given to agreements on foreign technology and their investors while Indian subsidiaries were provided upto 51 per cent foreign equity, private Indian companies were allowed to collaborate with foreign companies for seed production and so on (Seshia, 2002). Later on, with the greater relaxation on tariff bindings under Monopolies and Restrictive Trade Practices Act (MRTP) and Foreign Exchange Regulation Act (FERA), more foreign investments arrived in the Indian seed industry, making it a core industry by 1986. The industrial policy of 1991 further boosted trade and commerce by delicensing and deregulating the industrial sector. By 1995, the number of private seed companies with R&D swelled to almost 40 (Gadval, 2001).

Due to the lack of provision of dealing with Intellectual Property Rights (IPRs) in the 1988 policy, there arose a demand for a new policy ensuring plant variety protection by the private seed industry. India signed the agreement on TRIPs of Uruguay Round of multilateral trade negotiation of GATT in 1994 (that later became WTO). This agreement required all signatories to introduce strong systems of plant variety protection laws in the form of either patent or by an effective *sui generis* system or by any combination of both. As a result, the Indian Parliament passed the Protection of Plant Variety and Farmers' Rights Act 2001 (PPV&FRA). One of the progressive aspects of this Act is the provision of 'farmer's rights' that was inserted in it due to strong civil society mobilisations in the country. On the contrary, most of the countries of the Global South adopted plant protection in conformity with the International Union for the Protection of New Varieties of Plants (UPOV).

With the arrival of new policies like PPV&FRA 2001 with stringent IPRs and the mounting pressure to ease the norms for introduction of genetically engineered food crops, there has been dwindling space for autonomy of farmers and the food they cultivate. Seeds have always been understood to be belonging to the 'commons' and hence have been freely saved and shared by the farming communities in India and in many parts of the world. The increasing control of seed by the private seed companies and global agricultural conglomerates highly restrict farmer's access to save, share, exchange and sell their seeds. Though these provisions have been granted in PPV&FRA 2001 under 'farmer's Rights', they are conditional. A closer reading of the Act reveals that the criteria of 'DUS' that mandates the fulfillment of the condition of 'Distinctness, Uniformity and Stability' for a variety to be registered. Farmers find it problematic as their seeds are not morphologically uniform or in terms of its other characteristics and therefore usually do not conform to the DUS criteria. Farmer's varieties are constituted very differently as they are ecologically adapted, diverse, resilient and add on to the wide spectrum of plant genetic resources available, but the provision of DUS remains unmindful of these aspects.

It appears that the focus of the Act remains the regulation of commercial seed ensuring its associated IP protection. Also, as the share of hybrid seeds are fast growing with annual growth rate of 36.1 percent between 2006-13, whereas the rate of varietal seeds has sharply declined from 72 per cent to percent 36.8 percent by 2013, the non-hybrid open pollinated varieties will slowly be lost (Chandra, 2016). Given this scenario, if agriculture remains predominated by hybrids only, the whole purpose of insertion of farmer's right to save, exchange and sow seeds would become farcical. It is in this light PPV&FR Act 2001 is said to harbour countervailing norms and principles (Rangnekar, 2014). Though, the saving grace has been that the Indian plant protection Act did not subscribe to UPOV which is inclined strongly in favour of breeder's rights while farmer's position and assurances are either absent or poorly worked out. PPV&FR Act 2001 was followed by National Seed Policy 2002 to outline the orientation and vision of the Indian seed sector. New Seed Bill 2004 was proposed to replace the Seed Act 1966, but was revised as Seeds Bill 2011 that lapsed and reformulated as new Seed Bill 2019. However, this version of the proposed Bill carries forward similar problems like its predecessors. The definition of the term farmer itself, which now has been redefined as 'anyone who owns cultivable land or any other category of farmers who are doing the

agricultural work as may be notified by the central/State Governments. In this way, with the liberalisation of agriculture, the seed has become the pursuit of increasing commercialisation and profiteering (Kothari, 2000; Kohli & Bhutani, 2015).

III. Agroecological Traditions and Women: A Sustainable and Democratic Framework for Indian Agriculture

As discussed in the section above, the seed legislations need to work on those aspects that would strengthen the position of farmers vis-à-vis the agricultural corporations. Also, they must factor in the specific role of women in seed saving, biodiversity and local resource management. Most of the women farmers are small holders engaged in subsistence farming. They cultivate a variety of indigenous crops by frugal use of resources, maintaining the diverse genetic pool of the plant germplasm. This rich germplasm is used in the research on varietal crop improvement. Selection and cultivation of diverse heirloom varieties by women have ensured food security in different parts of India. Women have played cardinal role in agroecological practices like Baranaja, that involves the inter cropping and mixed cropping of 12 compatible crops in the Uttarakhand in the Himalayan foothills. Similarly, women play crucial role in farming in different district of Odisha as found in the field studies, due to their knowledge and practice of organic methods of pest, soil and crop management they make food production sustainable (Singh, 2021). Alongside, their role also allow them to generate agency of their own in terms of choices of crops, farming methods, farm managements especially in light of men's increasing outmigration for better jobs in the urban cities (Singh, 2022).

However, despite the enormity of women's contribution towards food production, the sphere of agriculture is marked by a gnawing gender gap globally (Huyer, 2016). In India, 78 percent of all female workers, and 86 percent of all rural female workers are engaged in agriculture, nonetheless only a few women own arable land and even fewer effectively control some (Agarwal, 2002). Women's lack of equal access and control over the land and resources makes them invisible as peasants. Gender inequality is reproduced in agriculture due to traditional gender roles and gender relations that hinder women's accessibility to sufficient financial and material resources in deeply patriarchal societies. Men and women play different roles in the domestic sphere and in society, that gets replicated in

all other domains including agriculture. In the hierarchy of sexes, women always occupy the secondary status vis-à-vis men (Beuvoir, 1949) and this subordination determines their restricted access to not only the means but also to relevant information, collaborative networks that men possess. Women farmers are unable to benefit from government schemes and agricultural credits as usually, land title is the condition for availing them. With this background of agricultural gender gap, in spite of their seminal role in agricultural productivity women are not able to generate any substantial overall gain in their status.

Efforts towards creating a gender sensitive policies in agriculture require revisiting the discourse of agriculture from the perspective of seed saving and a number of in-farm and off-farm functions performed by women. The goal of high production achieved through capital-intensive, agribusiness-controlled industrial agriculture would have to be balanced with the autonomy and space of the farmers to continue with subsistence agriculture with their farm saved seeds. This also fulfils a larger task of maintenance of agrodiversity. With the rising awareness about the extractive relationship of high input agriculture towards environment and natural resources, there is a requirement of supportive policies for regenerative agriculture widely engaged by women. Alongside, the minimum support price must cover other crops like millets, pulses and nutritive crops instead of selected crops like wheat and rice. Too much dependence on rice and wheat undermines effort in the diversification of crops and promotes their monoculture among farmers. To promote crop diversity, resilient crops like millets should be included in public distribution system (PDS). The news about cabinet approval of inclusion of raggi ladoos in Integrated Child Development Scheme (ICDS) by the Government of Odisha (Balam, 2020) is a welcome step in this direction. Such initiatives should be emulated by other states as well as it will not only mainstream the marginalised crops like millet, but will also ensure the inclusion of the local nutritious crops in the diets of people.

Women farmers optimise the use of natural resources by engaging in agroecological farming but agroecology remains the poor child of agriculture. Most of the subsidies and funding flow towards petrochemicals used in large-scale mechanised conventional agriculture. This is due to the reason that a neo-liberal framework of agriculture seeks solution to everything through the unifocal lens of the market, which may not be viable in the long run. Now that agroecology is being identified as a highly

efficient adaptive and mitigative tool to climate change, it should be incentivised at different levels through public policies and government schemes. As a remedial measure, public spending needs to increase on agroecological research and alternative agriculture representing localised, diverse cropping that carry a transformative potential. The diversion of support from conventional agriculture to regenerative agriculture will also address the problem of heavy metal contamination of water and soil caused by the chemical run off from agricultural fields. At the same time, it will also ensure the propagation of native heirloom varieties of seed used in natural agriculture by the women farmers. This will help in sustaining our rich legacy of tropical germplasm, which once lost will never be recovered. Numerous women farmers are engaged in rain-fed agriculture in different parts of India. Connecting them well with the local markets will financially empower them. Some grassroot farming organisation are already working on these line, for example, *Gram Disha Jaivik Samuh*, a SHG constituted primarily by women farmers, located in Pangna village Mandi District, Himachal Pradesh presents an example of how natural farming can be financially viable when directly connected with the consumers who want to buy from trustworthy farmer's groups. *Gram Disha* offers an example of creating a fair market of local supply chain *Jaivik Haat*, that sells its produce in the local and distant market and enjoys high consumer patronage. Such initiatives will decentralise food and farming and would encourage 'grow locally; consume locally' trend, minimising the carbon footprint on the environment.

Conclusion

The discussion in this article aimed to foreground the gender-blindness of the agricultural development paradigms and policies that have become sharper with the trade liberalisation and are further marginalising women farmers. The resilience of agricultural sector of India, to a great extent owes to the countless women engaged in seed saving and various kinds of subsistence farming that enhances the overall sustainability of the production process. Hence, the most rational response from the government should be to harness the synergy that these women create with the native seed varieties, optimised recourse use and community based conservation. This would require the policies to close the gender gap in agriculture by erasing inequities in access, ownership and participation and recognise the role of seed saving by women.

A democratic framework of governance can be created by supporting the agroecological farming and other diverse cropping systems practiced by numerous women farmers. Farmer's informal seed system should be supported and enabled to coexist along with the formal institutional seed system as farmers native heirloom varieties are crucial in maintaining the agrobiodiversity and a rich plant genetic pool. By formally recognising and incentivising women for seed saving and for their stewardship in biodiversity conservation, the policies can help check not only the erosion of plant germplasm but will also provide women a source of empowerment. These policies would carry tremendous potential of improving women's overall status in the society, thus also achieving a wider objective of women's empowerment. Such efforts would surely democratise the framework of governance in the domain pertaining to the seed and would ensure capability and autonomy of women farmers across the country.

References

- Agarwal, B., (2016) *Gender Challenges; Agriculture, Technology, and Food Security*, New Delhi: Oxford University Press.
- Agarwal, B., (2002) *Are We Not Peasants Too? Land Rights and Women Claim in India*, New York: The Population Council.
- Balam, B., (2020) "Inclusion Of Raggi Ladoos to Start in Koenjhar as a Part of Odisha Millets Mission", February 15, 2020, available at <https://milletmission.wordpress.com/2020/02/15/inclusion-of-raggi-ladoos-to-start-in-keonjhar-as-part-of-odisha-millets-mission-omm/> accessed 08.01.22.
- Beauvoir, S., (1949) *The Second Sex*, Harmondsworth, Middlesex, U.K. : Penguin Books.
- Bhutani, S., (2015) IPRs For Farmers: Role of Intermediaries, *Economic and Political Weekly*, 50(32).
- Gadval, V. R., (2001) "The Indian Seed Industry: Its History, Current Status and Future", *Current Science*, Vol. 84, No. 3.
- Government of India, *First Five-Year Plan 1956-61*, New Delhi, available at <https://niti.gov.in/planningcommission.gov.in/docs/plans/planrel/fiveyr/index1.html> accessed 08.1.22
- Gupta, A., (1998) *Postcolonial Developments; Agriculture in the Making of Modern India*, Durham, London: Duke University Press.
- Huyer, S., (2016) "Closing the Gender Gap in Agriculture," *Gender, Technology and Development*, 20(2) 105–116.

- Jafri, A., (2018) *Politics of Seed: Common Resources or Private Property*, New Delhi: Focus India Publication, Rosa Luxemburg Stiftung, South Asia.
- Klein, I. (2008). British Reforms, Commercial Agriculture, and Agrarian Distress in India. *The Historian*, 70(4), 732–752. <http://www.jstor.org/stable/24453995>
- Kohli, K., & Bhutani, S., (2015) “Access to India’s Biodiversity and Sharing Its Benefits” *Economic and Political Weekly*, 50(31), 19–22.
- Kothari, A., (2000) “Farmers or corporations? Critique of India's PVP Bill”, *Grain*, available at <https://www.grain.org/en/article/1926-farmers-or-corporations-critique-of-india-s-pvp-bill> accessed 05.01.22.
- Krishnamurthy, M., (2022) “Indian agriculture and its Contradictions” *Seminar*, Vol.749, pp.39-43.
- Mruthyunjaya and Ranjitha, P., (1998) ‘The Indian Agricultural Research System: Structure, Current Policy Issues, and Future Orientation’, *World Development*, Vol.26, pp.1089-1101.
- Peschard, K., (2017) Seed wars and farmers’ rights: comparative perspectives from Brazil and India, *The Journal of Peasant Studies*, 44:1, 144-168, DOI: 10.1080/03066150.2016.1191471
- Pionetti, C., (2005) *Sowing Autonomy: Gender Seed Politics in Semi-arid India*, International Institute of Environment and Development, London, UK.
- Pray, C. E., and Ramaswami B., (2001) “Liberalization’s Impact on the Indian Seed Industry: Competition, Research, and Impact on Farmers,” *International Food and Agribusiness Management Review*, Vol. 2, No.3/4, p. 409.
- Rangnekar, D., (2014) The cunning state of farmers’ rights in India: aligning with global law or emancipating farmers? Conference Paper for Discussion, *Food Sovereignty: A Critical Dialogue*.
- Report of the Grow More Food Enquiry Committee, 1952, New Delhi, Ministry of food and Agriculture, Government of India Press, also available <https://archive.org/details/dli.csl.594> accessed 07.01.21.
- Rao, C. N., (2004) “Indian Seed System and Plant Variety Protection,” *Economic and Political Weekly*, Vol. 39, No. 8 (Feb. 21-27, 2004).
- Scoones, I., (2002) Biotech Science, Biotech Business: Current Challenges and future Prospects, *Economic and Political weekly*, Volume.37, No. 27.
- Seshia, S., (2002) “Plant Variety Protection and Farmers’ Rights Law-Making and Cultivation of Varietal Control,” *Economic and Political Weekly*, July 6, 2002.
- Sherman, T. C., (2013) “From “Grow More Food” to “Miss a Meal”: Hunger, Development and the Limits of Postcolonial Nationalism in India, 1947-1957” *South Asia: Journal of South Asian Studies*, 36 (4). pp. 571-588.

- Shiva, V., (1988) *Staying Alive: Women, Ecology and Survival in India*, New Delhi: Kali for Women.
- Shiva, V., (1993) *The Violence of the Green revolution: Third World Agriculture, Ecology and Politics*, Zed Books, London.
- Singh, P. (2021) "Capturing the Narratives of Sustainable Farming: Study of Marginal Women Farmers in Five Districts of Odisha," *Indian Journal of Public Administration*, Sage Journal, Vol.66, Issue 4, DOI: <https://doi.org/10.1177/0019556120982199>
- Singh, P. (2022) Exploring Gender Approach to Climate Change and Agroecology: Women Farmer's Search for Agency in India, *Asian Journal of Social Science*, ISSN 1568-4849, DOI: <https://doi.org/10.1016/j.ajss.2022.09.004>.
- Sahai, S., (1994) Government Legislation on Plant Breeders' Rights, *Economic and Political Weekly*, Vol. 29, No. 26 (Jun. 25, 1994), pp. 1573-1574.
- Sahai, S., (2005) "Is Agricultural Biotechnology Suited to Agricultural Production in India? India's Agricultural Challenges" in Ramesh Chand (ed.) *Reflections on Policy, Technology and Other Issues*, CENTAD, Delhi
- Singh, S., (1982) "Agriculture Technology in Punjab Under British Rule: 1839-1947", *Proceedings of the Indian History Congress*, Vol. 43, pp. 479-486.
- The Seeds Act, 1966 (Act No. 54 of 1966) available on [http://nsai.co.in/editor/fmanage/userfiles/Rules/Seed_Act_1966%20\(1\).pdf](http://nsai.co.in/editor/fmanage/userfiles/Rules/Seed_Act_1966%20(1).pdf) (accessed 04-01-17).
- The Protection of Plant Varieties and Farmers' Rights Act, 2001 Act No. 53 of 2001, available on <https://indiacode.nic.in/bitstream/123456789/1909/1/200153.pdf> accessed 30.07.19.
- The Seed Bill 2011, GOI available at <http://admin.indiaenvironmentportal.org.in/feature-article/seeds-bill-2011-some-reflections>
- Varshney, A., (1998) *Democracy and Development in the Countryside: Urban-Rural Struggles in India*, Cambridge, New York: Cambridge University Press.
- Washbrook, D. (1994). The Commercialization of Agriculture in Colonial India: Production, Subsistence and Reproduction in the "Dry South", c. 1870-1930. *Modern Asian Studies*, 28(1), 129-164. <http://www.jstor.org/stable/312924>.
- Whitcombe, E., (1972), *Agrarian Conditions in Northern India: The United Provinces Under British Rule, 1860-1900*, Vol.1, London: University of California Press.