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POLITICAL ETHNOGRAPHY OF SEED SAVING PRACTICES AND AGROECOLOGICAL FARMING: EXPLORING THE AGENCY OF WOMEN FARMERS

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Abstract

This article aims to capture the political ethnography of seed-saving practices in indigenous agriculture based on the field research carried out between 2017 and 2019 in some regions of India. The study depicts the indispensable value of native seed for marginal women farmers engaged in subsistence and agroecological farming. The role of saving and curating seed provides women a voice, the much-needed role, in otherwise highly patriarchal rural societal settings. Ownership and control of seeds give them agency and autonomy in farming. However, a new agricultural regime, marked by trade liberalisation and intellectual property infringements, restricted seed saving by farmers. These transformations have not only eroded women's agency but have unprecedentedly altered the matrix of agriculture. Yet, marginal farmers are resilient in bypassing the adversities created by the politics and political economy of the contemporary global-agribusiness regime. This paper captures some of the initiatives that enable the reclamation of seed sovereignty and enhance food security, leading to the empowerment of farmers in the studied region.
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Keywords: Seed Saving Practices, Agroecological Farming, Women Farmers.

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Introduction

This paper aims to discuss findings from some existing practices of natural and sustainable farming using native seeds and heirloom varieties, based on a field study conducted between 2017 and 2019.[1] The study was undertaken to capture how marginal farmers and civil society groups work towards securing seed sovereignty and food security. These people are not only reviving traditional agricultural practices based on indigenous knowledge systems and agroecology but are also supplementing it with necessary innovations in farming.[2] The Green Revolution left a legacy of heavily contaminated soil, water and an overall degraded environment due to overuse of agrochemicals and increased financial and health burdens for the vulnerable farmers. The small and marginal cultivators have been increasingly pushed into the recurrent debt trap, in worst scenarios leading to suicides. The reason is their dependence on the market for agricultural inputs like seed, fertilisers, pesticides, and weedicides, which have untenable prices, sporadic availability and uncertain returns. Resilient in bypassing the adversities created by the politics and political economy of the contemporary global-agribusiness regime, the initiatives explored in this study make a strong case for the viability and relevance of alternative agriculture based on indigenous seeds.

Hypothesis

The contemporary world is marked by the increasing monopolisation of food and farming systems, which poses a severe threat to seed sovereignty and the autonomy of the farmers. However, the alternative spaces created by the civil society groups, and the small and marginal farmers engaged in seed-saving practices and sustainable farming offers emancipatory possibilities from the market, financial indebtedness and dependence on agribusiness. Farmers with small landholdings, a majority of whom happen to be women, not only find it profitable but also perceive seed-saving practices and sustainable agriculture as something that provide them agency, ensuring a certain degree of empowerment in the rural economy. These farmers, seed savers networks, and civil society groups play an essential role in reviving alternative discourse in agriculture, as shown by the area studied for this research.

Research Design

This study employs primary as well as secondary data sources. Extensive interviews of farmers and field surveys were conducted using two different questionnaires: one for the farmers and another for the experts/head of seed-saving organisations and civil society activists. The study also derives from the oral narratives of farmers and activists from the field pertinent to the research questions, existing traditional folk songs, local customs and rituals associated with seed and harvest of the studied region that tell centuries-old stories providing historical insight on the subject. Attending different Seed Diversity Festivals and workshops gave the author the opportunity to interact with the farmers across India who have been passionately preserving and exchanging innumerable varieties of crops. All these have added to the learning about seed sovereignty and its significance in sustainable agriculture.[3]

Area of Study

Field areas visited are Navdanya Beej Vidyapeeth, Dehradun, Uttarakhand (2017), Jardhar Village, Tehri Garhwal, Uttarakhand (2017 and 2018), Odisha (five districts: Nayagarh, Ganjam, Sambalpur, Bargarh, Sundargarh, 2018), Auroville, Tamil Nadu (2018), Beejom Farm, Noida, NCR Delhi, (2018), and Pangna Village, Karsog Valley, Mandi, Himachal Pradesh (2019). Field selection was based on the criteria of exemplary work done in the area of seed saving in the region by women farmers, seed savers and voluntary organisations (VO). Jardhar village in Tehri Garhwal, Uttarakhand, has been the site of origin of Beej Bachao Andolan under the leadership of legendary Vijay Jardhary. As one of the most significant seed saviours of our times, he has inspired farmers of the region and beyond to restore their heirloom varieties. Many landraces had almost vanished in the face of massive monoculture of wheat and rice under the Green

Revolution. Navdanya Beej Vidyapeeth in Dehradun, Uttarakhand is internationally recognised due to its work in saving native seed varieties, natural agriculture and women farmers' empowerment. The districts in Odisha were selected based on the activities of organisations such as Sambhav in Nayagarh and Ganjam district, Centre of Integrated Rural and Tribal Development (CIRTD) in Sundargarh, works done by independent farmer coordinators such as Saroj Mohanty in Sambalpur and Sudam Sahoo in Bargarh. Baag village in Karsog block of Himachal Pradesh was selected to study the work of SHGs like Muskan and Gram Disha Jaivik Samooh and the entire value chain in the organic production systems by small farmers in the participation guarantee scheme (PGS). Auroville, Tamil Nadu was chosen to explore sustainable farming, and the community living practised for decades. Beejom Farm of Noida, Uttar Pradesh offered an understanding of how an initiative of organic agriculture run by a small group of male and female farmers successfully operates in a semi-rural setting. The seed saving networks, seed savers and farmers were identified by applying the snowball sampling method.

Literature Review

Among the vast array of literature available in the area, a fair understanding of the subject can be gained by referring to the foundational ones. While M. S. Randhawa (A History of Agriculture in India, Four Volumes, 1980) provides a comprehensive history of agriculture in India, politics and political economy of agrarian transformation is aptly captured by works such as Akhil Gupta (Post-Colonial Developments, 1998) and Ashutosh Varshney (Democracy, Development, and the Countryside: Urban-Rural Struggles in India, 1998). However, the gender dimension of the effect of the modernisation of agriculture on women is discussed by Bina Agarwal (Gender Challenges: Agriculture, Technology, and Food Security, 2016) and Vandana Shiva (Staying Alive: Women, Ecology and Survival in India, 1993). These works show how the arrival of industrial agriculture has systematically eroded women's control over food and farming. Lathika George (Mother Earth, Sister Seed: Travels through India's Farmland, 2013) traces the richness of various indigenous farming methods in different regions of India. Vijay Jardhary, (Uttarakhand Mein Poushtik Khan-pan Ki Sanskriti, 2007 Barahnaja: Traditional Biodiverse Crop System in Uttarakhand, 2015) and Bharat Dogra, (The Life and Work of Dr R.H. Richharia, 1991) show the misconceptions and prejudices associated with Green Revolution and how it gradually devastated our crop diversity by monocultures. Literature like that of Carine Pionetti (Sowing Autonomy: Gender and Seed Politics in Semi-Arid India, 2006) offers substantive insights into the autonomy and agency of women in local seed networks in the Deccan Plateau of India. Reports of organisations and farmer's collectives like Alliance for Sustainable and Holistic Agriculture (ASHA), Bhagat Beej Swaraj Manch, Deccan Development Society (DDS), and Timbaktu Collective show the resilience of farmers and seed savers to revert the onslaught of the monocultures promoted by modern agriculture. These pieces of literature greatly supplement the author's understanding of the field findings.[4]

Limitation of Analysis

This work includes observations of fields from five different agroecological zones. India has a vast diversity of agroecological zones, each having specific indigenous farming practices. Therefore, one of the limitations of this research is the absence of findings from the rest of the regions, though other studies have been consulted to generate an understanding of them. The sample size of the women farmer interviewees also varied due to availability factors: 30 in Dangibandha village of Odisha, 33 in Jardhar village in Tehri Garhwal, Uttarakhand, 20 in Baag village Pangna, Karsog valley, Himachal Pradesh, 10 in Auroville, Tamil Nadu, and 10 in Beejom Farm, Noida, Uttar Pradesh.

Key Issues: Theoretical Reflections

The Saga of Seed in the Agrarian Transition: Loss of Autonomy, Genetic Diversity and Agency of Women: The rural economy is inevitably based on agriculture, of which seed is the foundation. It is the first link in the food chain and the basis of food production around the globe. Until recent history, seeds were considered shared resources, and farmers freely saved, exchanged and reused them within their informal seed networks. For farming communities, seed embodies countless years of heritage, social relations, identity and local knowledge. Women, being the custodian of seed and the indigenous knowledge associated with it, enjoyed considerable agency as their voice mattered in selecting seeds, crops, and other aspects of farming (Pionetti, 2006). This specific role of women ensured their control over farming, even in a very limited way, and provided them with an agency. However, agricultural modernisation, of which the Green Revolution served as the foundation, altered the seed dynamics by taking away the right of seed ownership from farmers. The transition of seed not only erodes their seed sovereignty but severely impinges on the women seed savers.

The endemic food insecurity and poverty drove India to adopt the new technology that eventually resulted in abundant food crop production and came to be known as the Green Revolution (1966-1985). By combining large investment in crop research, infrastructure, market development, credit system and appropriate policy support (Pingali, 2012), the Green Revolution achieved extraordinary crop yield, making the country food secure. This technology was crop-specific, capital and resource intensive and introduced in selected regions like Punjab, parts of Uttar Pradesh and Andhra Pradesh. These regions witnessed gigantic acreage of hybrid crops like wheat, rice and maise that continued expanding, eventually resulting in their monocultures at the cost of a variety of more nutritious and sustainable crops of local regions. Decades of monocultures of a handful of crops resulted in the irreparable loss of genetic diversity of vegetations having severe consequences for the future of food and farming (Kloppenberg, 1988; Mooney, 1983). In hindsight, it is realised that the environmental trade-offs in agricultural modernisation have been enormous. Not only have the ecology and climate altered forever, but the new agricultural framework has increased the financial burden and health hazards on the vulnerable farmers.

On the one hand, the increased mechanisation made farmers' skills obsolete (Aggarwal, 1996), and on the other hand, the dependency on the market for the company-sold high-yielding varieties (HYVs) has deprived them of their agency and autonomy (Shiva, 1988). These transformations have unprecedentedly changed the entire matrix of agriculture and rural economy, and in the process, it has systematically marginalised the other existing knowledge systems. The farmers with smallholdings are left grappling, with the dichotomies of the transnational agricultural regime being superimposed on the local realities and limitations.

The Green Revolution changed the political economy of the seeds by bringing them out from 'common resource' and transforming them into 'public goods' by hybridisation and then to be distributed by the States. However, as the progeny of hybrid seeds do not breed true to their parents, there is no point in saving them. Unlike in the earlier times, when farmers used their farm-saved seeds from the previous cycle, they had to recurrently procure seeds for every crop cycle, making them dependent on the State agricultural departments/agencies. This marks the beginning of the loss of farmers' ownership over the seeds. Gradually, with the private companies coming in and the downsizing of the public sector, seeds became the business of the market. Controlling seeds enables control of food and farming of the world; therefore, it is through seeds that industry entered agriculture as hybridisation solved the problem of capitalist technology's penetration of the agricultural sector (Kloppenberg, 1981; 1988). Hybrids provided an excellent opportunity to recover investments by making farmers purchase them regularly.

However, with trade liberalisation and intellectual property regimes, seeds have been further transformed into a biotic property. They have been brought into the private enclosure by patent regulations, thereby rendering saving seeds illegal and penalising. Farmer's access to seed and Plant Genetic Resource (PGR) has become heavily restricted, and farmers are no longer the centre of the seed systems. The global policy regime on the seed is defined by the Union for the Protection of New Varieties of Plants (UPOV), whereas the Protection of Plant Variety and Farmers Right Act, 2001 (PPV&FR Act) is the cardinal legislation governing these issues in India. By incentivising industrial seeds, UPOV and other seed policies across the countries are severely eroding the ownership rights of the farmers and the diversity in food and farming. They promote aggressive commodification of seeds privileging private companies while simultaneously marginalising the informal seed system and traditional farming knowledge. Unequivocally, such a policy framework aids the global agribusiness in consolidating their agricultural monopoly, ruining small landholders in India who are the majority of landholders engaged in subsistence farming. Ambiguities of seed policies on farmers' rights, withering government support structures and the predatory market of monopolistic agribusiness are posing a severe threat to the autonomy of farmers and are the major source of agrarian distress.

Push for Second Green Revolution through Agribiotechnology: Interestingly, most of the debates about technological interventions in agriculture are conducted in the semantics of the soaring world population and the inability of the human race to feed it. While there is a degree of truth in this Malthusian exigency, nonetheless, time and again, this premise has been used to justify the obsession with raising productivity without giving much consideration to the environment. Hence, all agricultural interventions in seeds are ingrained with the idea of centrality of productivism, in which increased production becomes the only rationale for agriculture. From the Green Revolution to the Gene Revolution, the vision of agriculture appears to be fixated on productivism (Raina, 2015; Kumar, 2019). However, on the contrary, in most of human history, agricultural production has been able to take care of the rising population. Enough food is produced to feed everyone abundantly in different parts of the world (Connor, 1994). In fact, there is now an overproduction of food in most countries, including India, with stacked government granaries. However, this overproduction has not been able to address the problem of destitution in developing countries, where people cannot buy food due to lack of purchasing power, called the paradox of plenty (Cullather, 2010). Unavailability of food is not the problem anymore, but unavailability of purchasing power is. Moreover, food security is ensured by favourable food policies, food distribution, the responsiveness of the government along with citizen's active participation.

On the other hand, the benefit of most of the agricultural interventions has been appropriated by the agribusinesses that use them to create an enormous stockpile of grains to supply to the food industry run by them. These corporations have monopolised the control of food production and distribution. Massive acreage of commercial crops like corn, soy and canola meant for running the food industry are grown. Only 24 per cent of this food reaches people, while most of it gets wasted in production, transportation, and storage (ETC Report, 2017). By now, it is sufficiently established that overproduction of food will not ensure global food security, but the solution lies elsewhere. Still, the pretext of the rising population is used as a ploy to justify and push a second Green Revolution based on agribiotechnology to raise food production. However, unlike the Green Revolution, agribiotech is driven by private capital seeking apparent commercial interests. Apart from its use in medical science, not much public good has come out of it that has helped the small farmers. For this reason, scepticism prevails in all the debates and projects of agribiotech. Fear is that it may become another tool in the hands of mega-corporations to consolidate their monopoly over the food chain.

Question of Appropriate Technology in the Rural Agricultural Settings: There have been illuminating debates on the choice of technology in the agricultural development intervention that calls to rethink how we visualise the significance of agriculture. The meaning and expectation assigned to agriculture in any society also determine the forms of knowledge and technological choices that the agricultural discourse could prioritise. The global agricultural vision is shaped by the privileged episteme of agricultural discourse emanating from advanced industrial societies. This episteme is firmly anchored in "ideals of modernisation embedded in numbers" (Cullather, 2010) that gave birth to the idea of productionism, signifying increased production as a solution to all world problems. The 'quantification of development thought' increased yield as the 'sine-qua-non' of agriculture. Henceforth, all agricultural research and programmes aimed to maximise production, enabled by technological breakthroughs, first in the Mendelian science of crop breeding and later in agribiotechnology.

Through this model, countries like the USA accumulated a huge grain surplus, emerged as world leaders, and used this surplus and technology transfer as a diplomatic weapon for aid to developing countries (McMahon,1987; Perkin, 1997). Additionally, this framework of agriculture knowledge became established as superior and universal markers of technical development and progress for all countries. However, this framework is based on intensive capitalisation, mechanisation, large-scale production sites, standardisation of products and replacement of human labour, in which agriculture is seen as a system of industrial production with the aim of converting every farm into a factory (Fitzgerald, 2003). This model of agrarian development is based on capitalist criteria of efficiency, derived from the experience of industrialisation and agricultural development of the West (Bray, 1994). While these parameters worked well for sparsely populated American and European societies, they appear misplaced in an overpopulated country like India. Technology has to be appropriate according to the context and ground requirements of a society. In a country where the majority of the farmers are small and marginal, what would be an appropriate technology, and how can technological choices be reoriented to benefit small and marginal farmers for whom survival is a constant challenge? Scholars like Bina Agarwal question whether favouring extensive tractorisation and mechanisation during the Green Revolution in India was the most appropriate technology in a labour-surplus economy (Agarwal, 2016).

Scrutiny of agricultural interventions in seed from the Green Revolution to the recent agricultural biotechnology highlight that they completely ignore other variables though they are high on production objectives. In this way, the actual or hidden cost of this technology is never accounted for in evaluating its efficiency. Every technology emanates from a power structure constituted by a network of science -innovation-industry-market with a vested interest that shapes and supports it. This makes the technology far from being culturally, morally and politically neutral as there are issues concerning political power behind the explicit arguments about tangible benefits and costs of any technology (Pacey, 1983). Hence, asking pertinent questions like who paid for the research of the incumbent technology and why? How and why did farmers adopt them, and who helped them in this process? What is the narrative of the farmers objecting to that technology? How a particular dominant technology like the Green Revolution practices 'politics of obsolescence' renders all already existing ways of farming and the indigenous knowledge associated with them redundant. Technical interventions in seed should be understood in the light of these perspectives in the current political economy.

Reflections from the Field

Reinstating Women's Empowerment and Agency by Reclaiming the Seed Sovereignty: Women farmers play a predominant role in subsistence farming. In the process of their everyday contact with and dependence on nature's resources, the poor rural women acquire indigenous knowledge. Usually, women select the seeds and have the most detailed knowledge about crop varieties (Shiva, 1988; Agarwal, 2016). From

selecting seeds for sowing to preparing organic manures and pesticides and conserving seeds for the next crop cycle, they are the fundamental pillars of indigenous farming. In this way, they have played a significant role in shaping crop and nutritional diversity, particularly in the Deccan Plateau dryland farming system in South India (Pionetti, 2006). In dryland regions all over India, women have relied on native seeds as they are time-tested, locally adapted and offer insurance for crop success and food security. The seed conservation and curation process provide women with an agency in farming. However, chemicalisation, commercialisation and widespread adoption of hybrids changed the gender dynamics of seeds. Women have been the frontrunners of traditional and subsistence agriculture, which gave them control over the farming process and the yield.

On the other hand, commercial agriculture with industrial seeds and agrochemical inputs has been driven by men, restricting women's hold on farming or farm produce. As industrial seeds require external inputs and technical knowledge of the scientists, women's knowledge and traditional farming wisdom became redundant. With this transition brought by new seeds and projected irrelevance of their knowledge, women got further excluded from decision-making in choices related to farming. Alongside, their position within the household and community also diminished significantly. When the financial burden of input-intensive cultivation became overwhelming due to crop failure and non-returns, many farmers decided to opt out and revert to traditional farming. While this provided women with an opportunity to revive their earlier system, men's seasonal migration has also shifted the entire responsibility of farming to women.[5] With farming directly under the control of women, there is a higher possibility of the use of natural methods of farming and the native variety of seeds.

However, the initiatives to revert to sustainable farming have been fraught with many challenges. The continued use of industrial seeds for numerous decades resulted in the vanishing of native varieties. Through the persistent efforts of seed savers and civil society organisations working in this area, many indigenous/heirloom varieties have been recovered. This section of the article captures explorations of such initiatives based on field studies undertaken in some of the agroecological zones in India. They constitute part of the spectrum of the seed sovereignty movement and are predominantly participated by women. These efforts towards repossessing seeds and agroecological farming are scripting new stories of women's success in rural, remote parts of India. They also enable women to have a certain degree of autonomy and agency, though a patriarchal societal set-up impedes overall gain in women's status (Singh, 2021). All field explorations from Jardhar village in Tehri Garhwal to Dangibandha, Khaoronati and Khupara villages in Odisha and Baag village in Himachal Pradesh highlight similar conclusions. The field findings clearly show that women are the seed warriors, keenly preserving the seeds, exchanging them amongst fellow farmers and passing on associated indigenous knowledge to the next generations. The interviews with the experts in the area of seed saving, such as Vijay Jardhary (Beej Bachao Andolan), Sabarmatee Tiki (Sambhav; Padma Shri Awardee), Bernard and Deepika (Pebble Garden), Bharat Mansata (Bharat Beej Swaraj Manch), Prasant Mohanty (Pradan), Babulal Dahia (Padma Shri Awardee) to name a few, emphasised the indispensable role of women in seed conservation. Vijay Jardhary states, "Women have been the forerunners in the field of seed saving, and it is to their perseverance, knowledge and commitment that we see a revival of sustainable agriculture not just in hilly areas but in other regions as well."[6] Though women's contribution is invisible in the public discourse and media, in reality, they provide the bulwark against the monocultures of the industrial seeds. In the process, they also work towards strengthening seed sovereignty by ensuring ownership, possession and control of a wide variety of indigenous seeds that are best suited to our agroecology and climate.

One of the prominent examples of

agroecological farming widely practised by women and men of Jardhar village, Tehri Garhwal, Uttarakhand is 'Baranaja'.[7] It is a traditional practice of multiple cropping in the region, called Baranaja, signifying farmers sowing 12 different crops in the same field to ensure food security.[8] The 12 crops cultivated in Baranaja include cereals, legumes, and oilseeds like mandua, lobia, rajma, navrangi, phapra, marsha, bhat, moong, jowar, gahath, urad, jakhia to make a wholesome harvest. Along with maintaining the health of the soil, this practice ensures that the farmers always have something to fall back upon in the case of failure of some crops. The field study showed that farmers routinely shifted cropping patterns, diversified livestock holdings and engaged in agroforestry for the optimal result. Most of these works are performed by women who possess the required knowledge for the same. Similar integrated and holistic farming applications are practised in many pockets across the country. As far as the question of increased yield is concerned, there is ample evidence for some native paddy varieties that produce enormous yields with organic inputs (see Table 1). Hence, this proves that hybrid seeds, along with associated agrochemicals inputs, are not the only possible way to achieve efficiency; rather, some of the indigenous paddies supersede the yield of hybrids as enlisted by the scientist R. H. Richharia (Richharia, 1977).

Table 1

Potential of Some High-Yielding Varieties of Indian Rice with Special Reference to Madhya Pradesh and Chhattisgarh

S. No.	Original Rice Variety	Improved Version Number	Paddy (kg/Ha)	Rice Grade	Maturity
1	Lalloo	Bd. 12	7024	Medium Fine	Early
2	Dhour	Bd. 23	6136	Medium Fine	Early
3	Koyalari	Bd. 811	7350	Coarse	Early
4	Nungi	Bd. 813	7623	Coarse	Early
5	Cross 116	Bd. 30	4000	Coarse	Medium
6	Kalam	Bd. 368	5510	Medium Fine	Medium
7	Beni Kath	Bd. 452	4080	Short Fine	Medium
8	Tedhi Banko	Bd. 207	6290	Long Fine	Late
9	Kala Mali	Bd. 108	7600	Coarse	Late
10	Safri	Bd. 200	5520	Medium	Late
11	Dubraj	Bd. 153	4958	Medium Fine	Late
12	Tedhi Banko	Bd. 207	6250	Long Fine	Late
13	Kariya Chini	Bd. 366	5550	Medium Fine	Late

Source: R. H. Richharia (1977) A Strategy for Rice Production to Ensure Sustained Growth in Madhya Pradesh, MP Rice Research Institute, Raipur, India.

In Odisha, in the regions explored, numerous small farmers have reverted to natural farming, which they find financially viable, health-wise harmless and sustainable. This transition has been facilitated by voluntary organisations working to revive sustainable agricultural practices by training and coordinating farmers' groups, creating awareness, helping them set up informal seed banks in the villages and providing them information about government schemes and programmes. For example, in Nayagarh district, Sambhav (VO) has played a crucial role in bringing a tidal shift to natural agriculture. Sambhav has a seed bank conserving 500 native varieties of paddy of the region along with legumes and vegetables, which are distributed/exchanged with the farmers of the villages around to grow and return a portion of the variety for conservation. Sambhav helped the women farmers of neighbouring regions to form a collective body. It serves as a platform for them to discuss and decide on selecting crops, seeds and related farming issues in regular meetings. My interviews with 30 farmers from three adjacent villages - Dangibandha, Khupapada and Khaoronati in Ganjam district - show that women farmers with small landholdings prefer natural agriculture. They find it financially viable and also feel that in such a system, they have a voice in all steps of cultivation - from sowing to the selling of the harvest of surplus produce.[9] Also, as women are the prime caregivers, diseases and deteriorating health due to the use of agrochemicals in conventional farming amplified their struggle. Shifting back to natural farming has enabled them to regain their say in the household as well as in the field. Now seeds are saved and preserved by them, giving them autonomy and power to decide what and when to sow, etc. Seeds represent people's food, cultural practices and identity. Hence, seeds have a prominent place in people's lives as they are used in all significant religious rituals, societal customs, and festivals (Singh, 2021). Because of this, seeds are traditionally worshipped in the farmers' households. Even the seed meeting of the women farmers' collective of the studied villages started with the lighting of a lamp, an offering of flowers and sweets, and blowing of conch (considered very auspicious by Indians) to worship the seed.

These findings resonate with those of Brahmanmara village in Sundargarh district, which has predominantly tribal population and semi-arid climate, and also become a new example of cooperative farming in the region. The village has 182 families (as mapped in the micro-level planning by CIRTD), and all are involved in agriculture. With the help of CIRTD women, farmers have adopted cooperative farming by collectively leasing land and adopting low-cost, high-yield farming methods like the System of Rice Intensification (SRI).[10] The concept of *Pancha,* which means working in groups, has become the basis of labour sharing and exchange. This system has proved to be a robust step towards food security and empowerment as these women farmers no longer have to depend on their community or family. They can ensure sufficient income to sustain themselves with dignity. Among the women farmers interviewed, Filisita Topna and Nirmala Barla have been doing collective farming for the past few years and have received awards from the State for the excellent yield of native sunflower and mustard. Another farmer, Mahargi Kaudi and her husband Jagannath Kaudi, achieved a bountiful harvest by System of Crop Intensification in 2014. The produce was measured by two agricultural experts from Krishi Vigyan Kendra, Sundargarh, namely Mr David and Mr S. Satpathy, and was found to be four times the yield obtained under the conventional system.[11] The approach of local production and consumption is gaining ground among these farmers. They now believe in growing for themselves and then selling the surplus to the local consumers. It is no longer considered wise to cultivate the cash crop for some remote consumers located far away from them. Villagers find this model sustainable as it saves on the transportation cost and is easy on the environment; farmers don't have to worry much about the product's shelf life, and there is some connection between the grower and consumer.

Whereas initiatives by voluntary organisations have been seminal, some farmers are working

even at an individual level to bring the desired changes in farming. One such farmer is Sudam Sahoo, who, along with his wife Sneha Sahoo, has become a role model in Katapali village in Barhgarh block of Barhgarh district, Odisha. The couple has created a seed bank *Anubhav* run by them that houses seeds of native varieties of local paddy, which were on the verge of vanishing due to the abundance of high yield heavily-market varieties. Through their efforts, these seeds are cautiously curated by Sahoo and other activist farmers like him. They understand the challenge imposed by the homogenisation of monocultures of hybrids pushed by industrial farming. The Sahoo couple has adopted a nearby village Baragada to convert it into an organic village. The author's interaction with 15 farmers from this village showed that, with the help of a support group, even the most degraded land could be revived following the ethos of natural farming. These initiatives by small farmers surely hold the key to improving farm yields, food security and poverty reduction.

Switching to traditional crops can also turn profitable if the farmers are linked directly with consumers, as in the case of farmer producer organisations (FPOs) and self-help groups (SHGs). Gram Disha Jaivik Samooh and Muskan Jaivik are such SHGs in Baag village of Karsog block in Mandi district Himachal Pradesh. Both are registered in the Participatory Guarantee Scheme (PGS) system of the National Centre of Organic Farming (NCOF) under the Ministry of Agriculture, Government of India.[12] Farmers along their families are engaged in collective farming of crops like paddy, millet, wheat and barley, peas, ladyfinger, brinjal, spinach, and fruits such as guava, pear, and papaya in their small patches of land. Their farming is based on the *Jwari* system,[13] an informal labour-sharing arrangement for farm work within the community. Women farmers are particularly content working with this arrangement, which makes them feel in control. In the South, there is an intense wave of the organic movement promoting indigenous seeds in many places, and Auroville is one of them. Almost all residents in Auroville practise organic farming as the symbol of sustenance and community living. Barnard and Dipika, the two seed saviours, have maintained an elaborate seed bank that houses all varieties of native crops of the region. They have been helping the women farmers of the neighbouring villages to farm organically using these seeds.

While all the above-discussed initiatives were based in rural areas, Beejom Farm, which spreads over 20 acres in semi-urban Sector 126 near Raipur village in Noida, presents an example of the possibility of sustainable living amidst the madness of chaotic and unsettled urban life. The farm was created in 2014 by Aparna Rajgopal and is based on the vision of an organic way of life which comes out clearly in its slogan *khet se pet tak (from the farm to the belly)*. Farmers working on this farm not only grow organic vegetables and crops but also convert them to value-added products such as pickles, *aam papad*, *amchur* powder from organic mangoes, and jaggery from sugarcane. The idea is to provide organic products to the local customer at a reasonable rate.

Conclusion

Despite the marginalisation of traditional farming and seed-saving practices by the hegemonic positioning of industrial agriculture, a majority of the farmers in the Global South practice them. The reasons are sustainability, freedom from debt, market dependence, and ownership of their seeds. Grounded in indigenous knowledge systems, these models of agroecology enable the farmers to reclaim seed sovereignty, food security and autonomy of farming. Efforts to raise food production by hybrid monocultures have failed to address the issues of food and nutritional security, particularly in rain-fed agriculture. While raising productivity is crucial, an excessive fixation with the yield criteria, paying minimal attention to nutritional content, environmental impact, and aesthetic and cultural value associated with food defeats the wholesome purpose of eating. The farmers understand the trade-off between the hybrids and native varieties. The sumptuous market profits drive those with large landholdings while marginal farmers, by default, practice subsistence farming with indigenous varieties of seeds. Yet, some also

abandon chemical farming after a few years of practice when it fails them recurrently due to incessant debts and health issues arising from pesticide use. It's agroecology, not overproduction, the key to rural development.

The narrative emerging from the field studies demonstrates that the practice of seed saving and agroecological farming not only ensures food security and food sovereignty in the rural regions but also provides an agency to the women farmers. By putting back the control of seeds in the hands of women through repossession, sustainable farming organisations and seed-saving networks, along with the numerous farmers, are also reclaiming seed sovereignty. However, policies remain a continuous challenge as conventional agriculture enjoys massive subsidies on petrochemicals, while sustainable/natural farming is bereft of any incentivisation. Lack of support structure, the hegemony of industrial seeds and disappearing indigenous varieties of seeds make alternative models of agriculture increasingly challenging to survive. The government must create an enabling ecosystem with favourable policies addressing the women farmers to bring them to the mainstream. This can be begun by recognising women as farmers and restructuring seed policies to develop mechanisms to reward women's work of seed curation and conservation. This will go a long way in protecting and promoting biodiversity. Strengthening and institutionalising the local agroecology models can help reclaim that space for the women farmers. This will bring them back into the mainframe and empower them to regain their autonomy over food and farming.

However, the act of seed saving and traditional farming is not for the sake of romanticising the traditional rural settings or recovery of cultural space. The objective here is to raise the issues of sustainability and seed ownership. In fact, this paper is aware of the fact that agrarian structures are also deeply embedded in the hierarchical caste, class and gender inequalities and oppression. The patriarchal ways in which agrarian systems operate make women's inclusion in decision-making extremely difficult. Nonetheless, the act of seed saving provides women with some leverage to assert their voice and ensures a limited degree of control over farming. While this ensures better intra-household bargaining power, a sense of empowerment from it also equips them to fight societal patriarchal arrangements. However, to ensure a wider gender-equity outcome, all the factors impacting women's empowerment in the social, political and cultural realms must be aligned for a meaningful transformation.

End Notes

1. This research survey covered different agroecological zones such as:1. Tehri Garhwal, Uttarakhand falling in Western Himalayan Region, 2. Dehradun, Uttarakhand- falling in Western Himalayan Region, 3. Odisha- Nayagarh District and Ganjam District, falling in East and South Eastern Coastal Plain, Sundargarh and Sambalpur in North Eastern Coastal Plains of North Western Plateau, Bargarh in Western Central table Land, 4. Auroville, Tamil Nadu- North Eastern Zone 5. Noida, Delhi NCR-Western Plain Zone, 6. Pangna, Himachal Pradesh falling in Mid-Hill Sub-Humid Agro-Climatic Zone.
2. Seed Sovereignty refers to farmers complete control and ownership of their seeds and process of food production. It ensures autonomy of the farmer in farming and provides food security by making food available and accessible to all without being dependent on the market for the same.
3. Apart from field visits, I attended Seed Fairs in New Delhi and Noida (Uttar Pradesh) organized by The International Federation of Organic Agriculture Movements (IFOM), in Auroville (Tamilnadu) organized by Sustainable Livelihood Institute, Auroville and had detailed conversations with the ground activists in the area of seed conservation.

4. Documentaries such as 'One man, One Cow, One Planet How to Save the World Biodynamic Agriculture versus Farming', 'Dance with Hands held Tight', (Director: Kavita Das Gupta, Krishnendu Bose), 'Jardhar Diary' (Director: Krishnendu Bose), 'Harvesting Hunger', (Director: Krishnendu Bose) immensely added to the understanding of the proposition and prospects of agriculture in contemporary times.

5. In rural areas men are generally available only in the sowing season for ploughing and preparing the field, after that they generally migrate to urban/semi-urban areas for employment opportunities. This fact was reported by the women farmers in the field studies in Odisha conducted by the author.

6. Based on a personal interview with Vijay Jardhary conducted on 28 June 2018 in Jardhar Village, Tehri Garhwal, Uttarakhand. The greatest contribution of Vijay Jardhary is that he motivated fellow farmers to leave conventional farming and start a hunt for the disappearing native seeds. Under his leadership Beej Bachao Andolan has recovered more than 300 varieties of Rajma, and numerous varieties of paddy, legumes, millets and vegetables. He introduced me to Bindu Devi, the earlier sarpanch of the Jardhar village, who happens to be another ardent seed saver motivating other farmers of the neighbouring regions.

7. In the agroecological zones of Himalayas, natural farming is the unanimous choice due to small field size, fertile soil, irrigation and livestock.

8. Baranaja is an indigenous farming practice in the state of Uttarakhand, in the Garhwal region which includes intercropping and mixed cropping of twelve or more crops.

9. My field visit to the seed meetings held in the Dangibandha village in March 2018 was facilitated by Sabarmati Tiki and Namita of Sambhav. Most of the farmers I interacted with, practiced conventional farming using agrochemicals some 10/12 years back. Now they have shifted back to natural farming supported by a strong network of farmers and voluntary organizations. Recognising the contribution of Sambhav Tiki in changing the face of rural Odisha through organic farming, its founding member Sabarmati has been conferred award by the President of India in 2018. For details kindly visit https://www.businesstoday.in/exclusive/specials/most-powerful-women-2018/diversified-farming/story/282002.html accessed 10.01.20.

10. Based on my interview of Nata Kishore Mishra (the founding member and the general secretary of CIRTD) and 15 farmers of Brahamanmara village, Sundargarh, Odisha conducted in March 2018. Many farmers had left for the local haat to sell off their product as it was Wednesday so less number of farmers could be interviewed. CIRTD is a voluntary organization, registered under section xxi of the society registration Act 1860 in 2001 and mainly works in the western part of Odisha. For details kindly visit website of CIRTD at http://cirtd.in

11. "Bumper harvest of Mustard by SCI Method" (Report prepared by Centre for Integrated Rural and tribal Development (CIRTD), Sundargarh, Odisha) refer http://cirtd.in accessed 10.10.20.

12. Kindly refer to https://pgsindia-ncof.gov.in/LGList.aspx where details of all farmers along with their phone numbers are given on the government website of PGS India. PGS is an alternative certification system that was adopted in India by setting up PGS Organic India Council in 2006. It is particularly conducive for small farmers in a short supply chain and enabled the direct participation and engagement of the producer and consumer. Please visit https://muskaanjaivik.wordpress.com for more information about the works of Muskan Jaivik SHG.

13. Jwari system represents labour to labour exchange managed by the community for different kinds of work including the family functions and construction works of the villagers. It is widely practiced in Himachal Pradesh and Uttarakhand.

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