
TRANSFORMATION OF AGRICULTURAL METHODS: CHALLENGES TO SUSTAINABLE FOOD SECURITY AND FOOD SOVEREIGNTY

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ABSTRACT

The concept of food sovereignty is gaining significance amongst many countries as a form of a global movement. Whereas the concept of food sovereignty initiates with an aim to focus on national self-sufficiency in food production and then it turns towards local self-sufficiency. This paper will discuss the possible ways to achieve food sovereignty goals through innovative institutional changes. The implication of food systems for invulnerable progress is the connection that links food security, nutrition, human health, the viability of ecosystems, climate change, and social justice. Various agricultural policies are motivated to focus on food supply to fulfill the 2030 agenda for Sustainable Development. In continuance of those policies necessitates having a comparison with the paradigms that prevailed when routing the agricultural change in the twentieth century.

The Current scenario necessitates understanding the importance of biotechnology to improve agricultural production. The production in agriculture must have standard progress and to achieve the same, the conventional methods of agriculture should go hand in hand with the biotechnological approach. But the lack of knowledge with respect to the usage of biotechnologies in an extensive manner may go to the root of the sustainability of healthy human beings. This research paper will be identifying the various technologies involved in food production and will be analyzing the root cause for adopting certain dangerous technologies inclusive of Genetically modified organisms, chemical-based fertilizers, and their inferences.

One way there is a need for the rapid growth of the agricultural sector is to satisfy the requirement of the growing population to ensure their right to food. On the other hand, the quality of production is coming down due to the innovative technologies adopted in food production which ultimately

mislays the proper nutrition which is supposed to be present in all food and gradually endangers the future healthy society.

Keywords: Food Security, Food Sovereignty, Climate Change, Technology, Genetically Modified Organisms.

1. Introduction:

The movement towards food sovereignty proposes a localist approach to meet food security while dispensing broader social, economic, and environmental benefits. The difference between food security and food sovereignty seems like mere semantics, but in the frenzied globalized world where transnational companies grab a majority of arable lands and they choose to export the entire crops grown on such lands would ultimately lead lack of supply of food. The disparity between wealth and land ownership is not a new phenomenon. However, the extent to which agricultural lands are owned within the areas of food insecurity makes food sovereignty vital a factor in food security. Food security and food sovereignty are of global importance, with many apprehensions not limited just to the developing world. Since the 1950s food security has been considered essential in terms of food production and satisfaction of requirements. The growth of biotechnology may be the opening of a novel agricultural revolution. It was believed that adequate production will assure adequate availability of food.

Being a human right, the right to food protects the right of all human beings to live in dignity, free from hunger, food insecurity, and malnutrition. Though agricultural production is tripled in the last fifty years, with the help of Green Revolution technologies and significant expansion in the use of land, and water, the rapid developments due to industrialization and globalization of food and agriculture led to food supply chains enlarging dramatically as the physical distance from farm to plate. But still, we could witness the persistent and widespread hunger and malnutrition remain a big challenge in many parts of the world. Presently the progression that we have may not guarantee the eradication of hunger by 2030 and not even by 2050. One way even climate change may endanger the situation of expanding agricultural yields in some regions of the globe. This paper reveals the extent of support given by agricultural transformation in protecting food security and food sovereignty in India. This paper has the objective to study the prevailing legislation in India which has its wide responsibilities to fulfill the obligations agreed upon the international covenants. Moreover, to satisfy the constitutional requirement as it is enumerated in Art.39(a) and 47 read with Art.21, to disclose the adverse impact of promoting technological agricultural methods and the effects of the same on Food

Sovereignty and to identify the need of involving both traditional and modern agriculture to achieve food security in the country.

The right to food and the right to food security has been gaining attention globally. There are various international instruments that enunciate these terms and create an obligation on all state parties to ensure that there is a constitutionally guaranteed right for all people without distinction of any kind. India, being an active member of the majority of such instruments, has an obligation to respect, protect and fulfill the right to food for every citizen of India. Though there is no clear provision in the Indian Constitution to recognize the Right to Food as a fundamental right, achieving the goal of food security and food sovereignty is a big challenge due to the largest population and misconception of modern agricultural practices.

2. Constitutional protection of the right to food and food security in India:

The right to food is a fundamental right in India, enshrined under Article 21 of the Constitution. In India, the right to food is a guaranteed right under the constitution. According to Article 21 of the Indian Constitution, the right to food is a component of the fundamental right to life, the Indian Supreme Court ruled in *PUCL v. Union of India* (2001).¹ This ruling was founded upon a string of decisions made by the Supreme Court in the 1980s and 1990s that expanded the scope of Article 21, whereas the protection to include the right to “live with dignity.” This justified several Directive Principles of State Policy, even though Article 37 of the Indian Constitution says that they “shall not be enforceable by any court.” This brought them under the purview of Article 21.

The National Food Security Act (NFSA) was enacted in 2013 to provide legal entitlements to subsidized food grains to a significant portion of the population in India. The act aims to ensure food security by providing subsidized food grains to eligible beneficiaries through the Public Distribution System (PDS), which includes items like rice, wheat, and coarse grains. The NFSA focuses on providing food to vulnerable groups, such as pregnant women, lactating mothers, children, and economically disadvantaged individuals. Global food security, which is defined by the availability, accessibility, utilization, and stability of food, aims to ensure that everyone has access to the fundamental foods they need for an active and healthy life. The fundamental right to life guaranteed by Article 21 of the Indian Constitution may be read to encompass the

¹ *PUCL v Union of India*, Writ Petition (Civil) No. 196 (2001)

right to live with human dignity, which may include the right to food and other necessities. Despite the absence of a specific provision in the Indian Constitution addressing the right to food, this interpretation is permissible.

The Right to Food is recognized in the Universal Declaration of Human Rights, 1948. “Everyone has the right to a standard of living adequate for the health and well-being of himself and of his family, including food”². “Every State is obliged to ensure for everyone under its jurisdiction access to the minimum essential food which is sufficient, nutritionally adequate and safe, to ensure their freedom from hunger”³. “The right to food is an inclusive right. It is not simply a right to a minimum ratio of calories, proteins, and other specific nutrients. It is a right to all nutritional elements that a person needs to live a healthy and active life, and to the means to access them”⁴.

The Right to Food is inherent to a life with dignity whereas Article 21 of the Indian Constitution guarantees a fundamental right to life and personal liberty which needs to be read with Articles 39(a) and 47 to understand the nature of the commitments of the state in order to safeguard the effective realization of this right. Moreover, the Indian Constitution supports the Right to Food within the purview of Fundamental Rights which is enforceable by virtue of the Constitutional remedies given under Article 32 of the Indian Constitution.

India, being an active member to ICESCR, it has an obligation to respect, protect and fulfill the right to food for every citizen of India. Though there is no explicit provision in the Indian Constitution to recognize the Right to Food as a fundamental right, comparable human rights provisions are found in the Part III and Part IV of the Indian Constitution. Indian Judiciary also extended its interpretation to bring the Right to Food within the ambit of the Right to Life guaranteed under Article 21 and also monitor the state’s obligations undertaken⁵. The Supreme Court of India observed that the right to life guaranteed in any civilized society implies the right to food, water, a decent environment, education, medical care, and shelter and the government has a constitutional obligation to take steps to provide all individuals a dignified life and with adequate food⁶. The Supreme Court also held that the basic needs of man have traditionally been accepted to be three – food, clothing, and shelter. The right to life is

² Article 25 UDHR

³ *General Observation 12*-Committee on Economic, Social, and Cultural Rights

⁴ The Right to Adequate Food, Fact Sheet No. 34, The Office of High Commissioner for Human Rights, UN.

⁵ People united for civil liberties (PUCL) v. Union of India, Writ Petition (Civil) No. 196 of 2001.

⁶ Maneka Gandhi v. Union of India AIR 1978 SC

guaranteed in any civilized society. That would take within its sweep, the right to food, the right to clothing, the right to a decent environment, and reasonable accommodation to live in.⁷

Governmental initiatives and programs to ensure food security, have been initiated at the multi-levels. Our resources have grown as a result of our development and acquisition of critical technological skills. Development is a methodical process, and as a result, we have more opportunities and feel more emotions. It is never acceptable to mistake sustainable development for unrestrained expansion since development takes time. To ensure that everyone has access to food at all times, a viable solution must be found. As was already said, the Indian government has consistently fought for food security. There are certain governmental initiatives as follows:

The Public Distribution System: India experienced severe food shortages during the Indo-China War and the Indo-Pak War. After the Green Revolution, food scarcity hit urban areas hard, therefore the Indian government created laws and programs to help. Following that, this distribution strategy was expanded to include tribal regions and places with high rates of poverty. The Public Distribution System (PDS) was jointly run by the federal and state governments. Through the Food Corporation of India (FCI), the Central Government was in charge of deciding how much food grain should be purchased, stored, and delivered to the State Government. Who was eligible for ration cards, how much grain should be given, and how much grain should be kept were all determined by the State Government.

Antyodaya Anna Yojana (AAY): Antyodaya Anna Yojana seeks to reduce hunger and provide BPL residents with at least some level of food security. An NSS survey found that over 5% of people in India go without two meals each day. The worst feature of life is without a doubt this. AAY was therefore developed by our government for people who are 'hungry' themselves. In December 2000, it was introduced to a million of the poorest families. Through this program, the government gave out food grains at a large discount, such as Rs 2 for a kilogram of wheat and Rs 3 for a kilogram of rice.

The Mid-Day Meal Programme (MDM) was made available to the Madras Corporation in 1925 by the British government. Pondicherry was ruled by the French in 1930. The tagline of this initiative is not the same as the one currently employed by the Indian government. After

⁷ *Shantisar Builders v Narayanan Khimala Totame* (1990) 1SCC 520

independence, MDM gradually extended to several states, starting with Tamil Nadu and then moving on to Kerala and beyond. Since 1995, the Indian government has been managing this program as a part of the National Primary School Nutrition Support Programme. More than 12 million children across the nation have access to this service. The MDM's two main objectives are to improve children's nutritional status and encourage frequent attendance at school.

The Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA): In 2009–2010, 8.41 million and 3.36 million primary school students, respectively, benefited from the Mid-Day Meal Scheme (MDM). In India, a huge section of the population is employed as unskilled manual laborers in addition to living in extreme poverty. In this case, more funding from the government is necessary to maintain current rural livelihoods. In this regard, the Indian government has implemented a variety of mandatory labor laws that provide daily paid employment at the federal minimum wage in positions with the government.

3. The Evolution of Agricultural Practices.

Agriculture is holding a tremendous role in the advancement of human society. Agriculture has been around since roughly 10,000 B.C.E. and has allowed humans to deploy ecosystems and maximize population growth⁸. Agriculture has fortified people to live and progress in rich, permanent settlements all over the world. When humans first discovered the potential of planting seeds, they suddenly had the ability to explore the world and establish infrastructures wherever soils were fertile. The techniques that are involved in agriculture depend on local climate conditions, but most farmers continued to plant on the same field for years together until the soils get exhausted of all their nutrients. Later on, there was a new technique called intercropping in which a variety of crops are grown together, creating a microclimate that favors the survival of each plant and helped to maintain its fertility and to enhance yield. The different techniques like irrigation, intercropping, and crop rotation have helped in increasing the efficiency of agriculture. But the factors like the huge populations, economic instability, and climate change, that necessitate producing higher yields have contributed to shifting the practices.

3.1 Traditional Farming:

Traditional farming is the ancient food production system and the original type of agriculture

⁸ <https://you.stonybrook.edu/environment/sustainable-vs-conventional-agriculture/>

it has been practiced for thousands of years. it is not only the world's oldest farming method but also the main source of improvement in the conventional techniques in modern cultivation. Apart from conventional cultivation practices, traditional agriculture practice has the potential to improve pest management. There are local knowledge-based pest management practices applied to traditional agricultural practices performed by marginalized farmers in India to mitigate pests, such as time of cultivation, grain storage, frequency of tillage, and combination of the mixed crop rotation. Even perennial crops are cultivated to retain the moisture and nutrients of the soil.

3.2 Organic Farming:

Organic farming evades chemical pesticides and fertilizers and pursues to raise soil fertility through nourishing soil micro life with residues from life such as garbage compost and sewage, manure, plant residues, food processing wastes, etc. It is a method that comprises only the natural ways to cultivate plants and rear animals. Moreover, it involves only the use of biological materials rather than involving synthetic substances to maintain soil fertility and ecological balance thereby minimizing pollution and wastage. This method relies only on ecologically balanced agricultural principles such as crop rotation, green manure, organic waste, biological pest control, and mineral and rock additives. Hence no petrochemical fertilizers and pesticides are allowed in organic farming. According to the International Federation of Organic Agriculture Movements, organic farming is a production system that sustains the health of soils, ecosystems, and people. Organic farming combines tradition, innovation, and science to benefit the shared environment and promote fair relationships and good quality of life for all involved⁹. Exponents of organic food state that they are healthier and more nutritious compared to non-organic ones.

3.3 Biotechnological farming:

The intervention of agricultural biotechnology which is defined as 'any technological application that uses biological systems, living organisms, or derivatives thereof, to make or modify products or processes for specific use' can make a significant contribution to productive and sustainable agriculture. Biotechnologies range from low-tech approaches, such as artificial

⁹ Organic Farming Is A Boon To Soil and Human Health Dr. Birendra Singh Chaudhary, Department of Agriculture Chemistry & Soil Science Amar Singh (P.G.) College, Lakhaoti, Bulandshahr

insemination, fermentation techniques, and biofertilizers, to high-tech approaches and advanced DNA-based methods, such as genetically modified organisms (GMOs).

There are observations that have shown that there is no effect on the nutrition content of the food if it is grown organically or not. In nutshell, spinach is spinach, an apple is an apple regardless of the way the food is grown whether organically or conventionally the vitamin content will be the same. However, in a country like India, having a huge population requires the adoption of the organic method alone of farming may be catastrophic.

4. Need for the transformation of agricultural practices to satisfy food security:

The agricultural sector needs to engage an extensive range of technologies and farm practices across many different farming systems and structures to meet a variety of changing and assorted demands from consumers for food and other goods which are essential to be supplied by agriculture. This leads the farmers to look for new technologies to increase production. The right to food and food security are fundamental human rights resulting from the International Covenant on Economic, Social, and Cultural Rights (ICESCR). It necessitates, the adoption of agricultural biotechnology, increased usage of biotechnology offers the opportunity to increase crop production lower costs, improve food quality and safety and enhance environmental quality. The adoption of biotechnology innovations in the agricultural sector will be influenced by consumers' higher level of demand. The commercial success and social benefits of agricultural biotechnology have been influenced by the development of technology to meet the demand of consumers for cheaper, high quality and safer food. Agricultural biotechnology is not still adopting the socially acceptable technologies as such, in view of the question of sustainability of a healthy environment and healthy life.

Biotechnology is broadly defined as the use of living organisms to solve problems or make useful products. Biotechnology is part of the natural evolution of agricultural biology and could curtail the time for rising improved crops. The future of agricultural biotechnology has been influenced by various factors like economic, scientific, and social factors. The development of agricultural biotechnology provides the opportunity to increase crop production, lower farming costs, improve food quality and safety, and support environmental quality. Though there are negative impacts identified, they may outweigh the potential benefits. Generally, biotechnological techniques are used to intensify the capability of plants to control pests and disease, tolerate environmental pressure, and increase food qualities like flavor, texture, shelf-

life, and nutritional content. The growth and use of innovative technologies have brought about a continuing increase in agricultural productivity. But Agricultural Biotechnology is reducing the usage of pesticides, herbicides, and other toxic chemicals used by the farmers to protect the crops. But the consequences of genetic modification involved through the seeds may act as a new allergen and can induce allergic reactions in humans. As it involves transferring a gene from one and inserting them into another species, it invades the boundaries of reproduction with unexpected interactions and unpredictable effects. The genetic engineers use antibiotic-resistant genes which may impact the consumers by transferring these antibiotic-resistant genes to human pathogens and making them antibiotic-resistant, which will induce higher health risks.

5. The sustainability of food sovereignty and food security at the inception of Modern Agricultural practices:

The World Food Summit, held in 1996, declared that ideal food security includes the global population, whereby all people have access to sufficient, safe, and nutritious food, encompassing both physical availability and economic access. However, the responsibility to enact these rights rests mostly on the nation-state, not the international community. On the other hand, some argue that repeated affirmations of human rights within the international realm do imply some global responsibility. Therefore, food security exists when all people in all places have access to sufficient, safe, and nutritious food. Clearly, that theoretical aim has not been met. Furthermore, if current mechanisms are not facilitating the aim, it may require consideration of entirely new models of how countries engage with one another¹⁰.

Food security means the availability and access to sufficient safe food, whereas food sovereignty involves both ownership and the rights of local people to define local food systems, without first being subject to international market concerns. An important distinction must be made between food sovereignty as a theoretical construct and food sovereignty as a movement. The food sovereignty movement considers that the practices of multinational corporations are akin to colonization, as such companies buy up large tracts of land and turn local agricultural resources into export cash crops¹¹. Food Sovereignty remains pertinent today and is witnessing

¹⁰ <https://www.logancochrane.com/images/pdf/Food-Security-or-Food-Sovereignty---The-Case-of-Land-Grabs--JHA-2011.pdf>

¹¹ *ibid*

various aspects of daily cultural, social, and physical life and counters the devastated communities.

In India, the food sovereignty movement started in the early 20th century. There are two movements namely Anisuba Lopi Nan¹² in the year 1939 and Chaklam Khongchat¹³ on the year 1965, originated from Manipur. Food Sovereignty is otherwise known as Anna Swaraj which is the right and freedom to grow different and nutritious food and also have access to safe and healthy food. It aims to promote the consumers and producers rather than support food sovereignty, whereas it grows from the household community, regional, and national levels. The Navdanya movement¹⁴ also promotes bio-organic farming which further promotes food sovereignty and food and food nutritional security. Right from the 1990s, there are many instances to understand the activities against Genetically Modified Crops. The field study conducted on GM crops has proved that several companies are fallacious. There was a PIL filed in 1999 against a US-based company named Monsanto and even the Indian authorities were questioned for illegal and unwarranted ways by which GM crops were introduced in India and trials were conducted to prove the gross violations of environmental laws as well. The Food Sovereignty Alliance of India was established in 2013 to have a common vision of food sovereignty while protecting sovereign rights to food for future generation as well. There is an organization called ASHA¹⁵, an informal network of hundreds of organizations across 20 states. National Food Security Act 2013, is one of the signified laws to guarantee the right to food to every citizen as well as to ensure food sovereignty in the country. The Food Safety and Standards Act, of 2006 consolidates various Acts and Orders in regard to people's health and safety of life and stands as a watchdog carrying its function to uphold the fundamental rights of every individual.

The FSSAI launched the Food Safety Mitra Scheme to strengthen food safety compliance and facilitate food businesses in adhering to regulations. Food Safety Mitras, trained professionals, assist food businesses in obtaining licenses, conducting audits, and ensuring food safety standards are met. They underline the importance of proper food safety regulations, labeling, and monitoring to protect public health and enhance consumer confidence in the food supply

¹² 2nd Women Agitation in Manipur to ban rice export and then led to constitutional, political and economic reforms.

¹³ Hunger Marcher's Day under the aegis of all Manipur Student's Union.

¹⁴ Navdanya is an Earth Centric, Women-centric, and Farmer-led movement for the protection of Biological and Cultural Diversity- <https://www.navdanya.org/>

¹⁵ Alliance for Sustainable and Holistic Agriculture.

chain. India has made significant efforts to improve its food safety regulations and standards, but there have been concerns about the enforcement and effectiveness of these regulations. While there have been improvements over the years, some aspects of the food trade in India still face challenges related to regulatory enforcement, food adulteration, and safety standards. Continued efforts are required to train and build the capacity of food inspectors, regulatory authorities, and stakeholders to ensure the effective implementation of food safety regulations.

6. Suggestions and Conclusion

There is a dire consequence of ignorance of food safety aspects for the producers and the consumers as well. The status of food sovereignty in India is still not good despite having many enactments and schemes. All the food produced and made available in the market is either adulterated or sub-standard foods in which the quality is entirely compromised. There are hundreds of farmers' organizations in India that are protesting against three farmers' enactments. In this situation, there is a necessity for the adoption of certain stringent strategies with the help of the supporting enactments to ensure that the food so supplied is safe and healthy without compromising the food sovereignty of the nation. We cannot deny that there is a recognition of the rights to food, food security, food safety, food sovereignty, and the right to health but not through the explicit constitutional provisions, but only in the realm of the right to life guaranteed under Article 21 of the Constitution of India. This paper would intend to suggest that there is considerable and reliable attention to separate legislation involving technologies in modern agricultural practices and proper implementation procedures that would enable the food supply system exactly from production to consumption safe and healthy. Definitely, there will be no question of compromising the right to food in the aspect of food security or the right to health.

The food items that have been produced either through agriculture or through an industry involve the usage of harmful chemicals. This process enables the economy of the country to progress in food trading globally. But, the residues left over the food products impact the health of the human being in society and ultimately question the healthy survival of every living organism. Undoubtedly, any developing country for that matter should focus on food productivity for their self-reliance in order to ensure the right to food which is also been recognized as a human right. When the country runs behind in fulfilling one of its fundamental rights there should be a focus on balancing of any other rights that fall within the same meaning.