SUSTAINABLE AGRICULTURE DEVELOPMENT IN INDIA:EMERGING ISSUES, CHALLENGES AND OPPORTUNITIES

ABSTRACT: Agriculture is one of the most prominent sectors of the Indian economy. It is the source of livelihood for almost two third of the rural population workforce in the country residing in rural areas. In the present scenario, agriculture has progressed substantially well and is becoming more and more efficient over time. The achievements of quantum jump in the production and productivity can be attributed to the introduction and breeding of HYV variety, which adequately demonstrated the vast potential of science-led revolutions Green, White, Blue, etc. Despite these appreciable achievements, challenges associated with climate risk and depleting natural resources. Almost 40.0 percent of the crop land has been degraded in less than four decades, and almost 25.0 billion tonnes of top soil was being lost to erosion every year. The instinct performance of Indian agriculture depends on the performance of abundant resources, the sustainable strategies and methods adopted to face dryness due to the decrease in the rainfall, the agriculturist has to use the innovative strategies. It is in this context that the present paper seeks to draw the attention and need of a thorough study regarding sustainable agriculture development (SAD) in India. To achieve social and economic equality, sustainable agriculture methods must strike a balance between environmental health and economic prosperity. As a result, good management of both natural and human resources is critical. The Indian government has taken several efforts to promote long-term sustainable agricultural development.

Keywords: Sustainability, Agriculture, Development, India, SDG

INTRODUCTION

The elimination of extreme poverty for sizable portions of the world's population and the establishment of sustainable economic growth in the Global level have not been achieved over decades of development cooperation and national efforts, despite some remarkable achievements of international cooperation and national success stories of development (de Vries and Jochemsen 2019).Even without a treatment for creating the conditions for sustainable development, there is still no magic solution to the problem of economic growth in the developing economies. Interestingly, most developing nations have disregarded agriculture in development as a crucial sector for sustainable development, despite the fact that it dominated practically all traditional economies (Hwa 1989; Pingali et al. 2019).

On the other hand, agriculture significance to the global economy and intrinsic potential appears clear. According to figures from the World Bank, the agriculture sector made about one-third of the global gross domestic product (GDP) in the year 2014(data.worldbank.org). Agriculture continues to be the primary source of livelihood for most people in the developing economies, supporting 60.0 per cent of the world's population (FAO, 2015). Obviously, agriculture sector is essential for meeting our fundamental need for food at global level. However, around 820 million people worldwide still experience hunger, and roughly half of the world's population is undernourished. This shows that agricultural productivity is still low in the majority of developing nations and it is difficult to achieve a world free from hunger and malnutrition. An estimated 20-25 per cent of the world's yearly greenhouse gas emissions is attributed to the three industries of agriculture, forestry, and land use change, which frequently coexist (IPCC, 2014).

Among the 17 Sustainable Development Goals (SDG's) set by the United Nations General Assembly in 2015 to address today's global challenges by 2030, almost all of the goals are directly or indirectly related to agriculture sector, giving agriculture a multidimensional meaning. SDG's goals range from politics to global hunger and climate change resilience. As agriculture acts as a key bridge between people and the environment, it must be considered an integral part of the Sustainable Development Goals. Due to the alarming rate of populationgrowth, the food crisis is still the world's most intractable problem. About 780 million people were malnourished in developing countries (FAO, 2017).

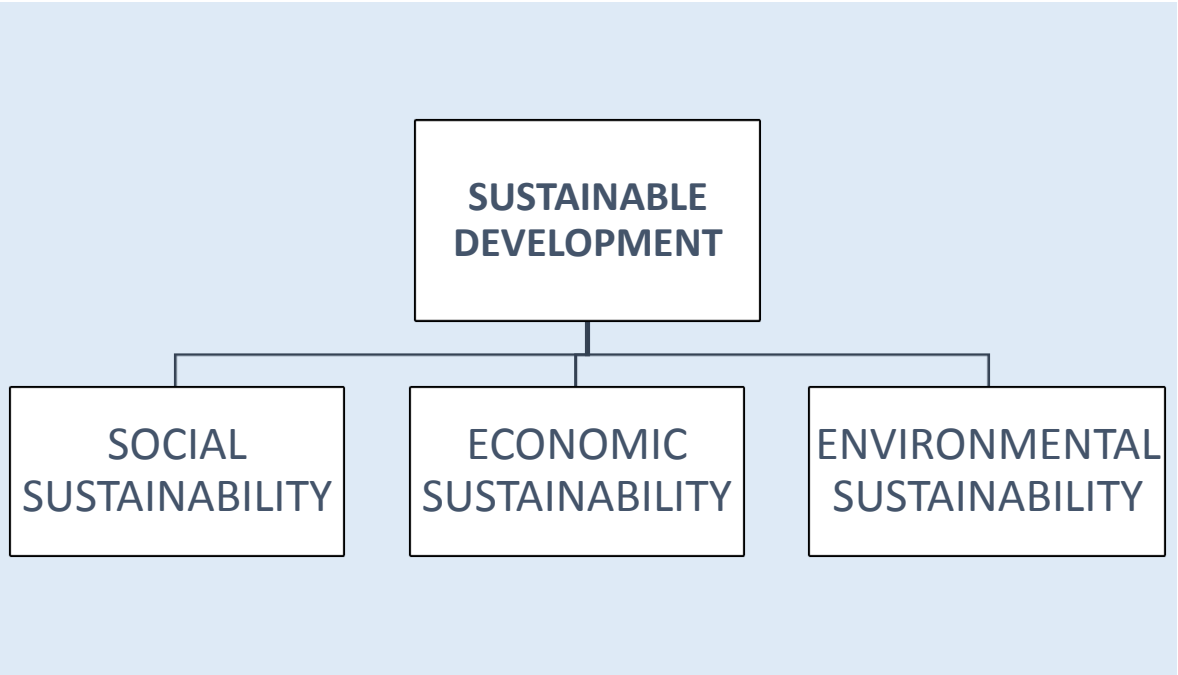
The sustainabilitystates to eternal capabilities and is a systemic problem. Sustainability as a goal seeks the constancy of an activity or system, where the system is a grouping of different

elements, components, subsystems or items that combine into a single whole that helps organize the system and maintain its integrity (Von Bertalanffy, 1968). A sustainability system specially in agriculture sectoris one that persists or persists in response to new stresses and shocks due to the interactive nature of its components (Costanza and Palten, 1995). It does not mean that the lifetime of the system is infinite, but sustainable is a system that achieves its expected life cycle according to the temporal and spatial scale.

SUSTAINABLE AGRICULTURE

Agriculture sustainability seeks to use a wide range of pest, food, agroforestry, soil and water management techniques in an integrated manner. The by-products or waste of one component or enterprise become inputs to another component or enterprise. As natural processes increasingly replace external inputs, environmental impact is reduced. The agriculture sustainability contributes to environmental services such as soil conservation, watershed services, biodiversity and carbon sequestration (IPBES 2019) and only if these services are maintained will Indian agriculture have a future. Unfortunately, it is now vanishing in India. Indian policies have promoted a heavy focus on cereal crops viz., wheat and paddy, causing land flattening and loss of environmental services, particularly biodiversity, through unwise use of inputs. This agriculture sector growth at the expense of the environment must change to more sustainable approaches, otherwise not only the environment but also the economy will suffer in the long term. Sustainable intensificationthrough improved technology, scientific knowledge and management may be the way forward of this sector (Pingali 2012, Pretty et al. 2011). This means increasing agricultural productivity without increasing inputs and reducing externalities (for example greenhouse gases) gas emissions.Traditional farming methods, farm self-determination and inclusive social learning networks have also been shown to contribute well to sustainable agriculture (Choudhury 2019).

Sustainable agriculture means meeting the needs of present and future generations for its products and services, while ensuring profitability, environmental health and social and economic equity. Sustainability is a process, rather than an end. Therefore, it requires the development of policy, governance, technical and financial frameworks which, support farmers and resource managers involved in the process of innovation. Sustainable agriculture integrates three main goals - environmental health, economic profitability, and social and economic equity. These three major goals are directly related to the suitability of agriculture sector.



Flow Chart 1: Author's Construction

As one-sixth of the world's population resides in India, this makes India the key player in establishing the sustainable development worldwide. For country like India, the practice of sustainable agriculture is important because it accelerates the productivity, efficiency, employment, and provide guidance to reduce the practices, which affect the quality of soil, water resources and degradation of other natural resources. Hence, it aims to enhance the level of production without harming to the environment. But, the biggest 'challenge' for Sustainable Development is the 'dilemma' of developing nations as economic growth and development directly linked to the immense risk of climate change and therefore faster economic growth for the elimination of poverty, hunger, inequality, unemployment and social injustice without impacting the global environment is challengeable task. India is at a tipping position in ensuring sustainable agriculture and further sustainable development as whole globally as it is a global agricultural powerhouse (World Bank, 2016).But the triple challenge of feeding a growing population, providing a livelihood for farmers, and protecting the environment.

The performance of Indian agriculture depends on the available abundant resources, the sustainable strategies and methods adopted to face dryness due to the decrease in the rainfall, the agriculturist has to use the innovative strategies. It is in this context that the present chapter seeks to draw the attention and need of a thorough study regarding sustainable agriculture development in India. Sustainable agriculture system includes many methods such as no till farming, mulching, contour farming, crop rotation and diversification, organic

farming, etc. To achieve social and economic equality, sustainable agriculture methods must strike a balance between environmental health and economic prosperity.

MATERIAL AND METHODS

The present chapter is primarily based on secondary data. The database is retrieved from various government sources at national level as well as international level. The data of the present chapter has been collected from Reserve Bank of India (RBI) database, Government of India, Ministry of Agriculture & Farmers Welfare database, Government of India, World Bank database and Food and Agriculture Organization (FAO), United Nations. Simple statistical techniques have been used for secondary database. The Compound annual Growth Rate (CAGR) of sector-wise components of Indian economyhas been estimated by usinganextensively accepted exponential model, $y = ab^te^u$. The Compound annual Growth Rate (CAGR) is usually estimated by using the following semi-log functional form;

$$\ln(y) = \ln(a) + t\ln(b) + u$$

Where, y represents dependent variable whose growth rate is to be estimated; t representsindependent variable (time) and u representsdisturbance or error term.Moreover, 'a' and 'b' are the parameters to be estimated. The CAGR in per cent term is estimated as:

$$CAGR = \{Antilog(b) - 1\} * 100$$

RESULT AND DISCUSSION

Sectorial Share in GDP: Agriculture sector is facing striking challenges due to growing population and their increasing demand for food with shrinking resources. Agriculture is vital sector for human existence and the world's population is expected to grow to nine billion by 2050. Consequently, demand on global food systems intensifies every day. Hence, there is urgent need to shift agriculture from subsistence farming to profitable farming backing with technological advancement, improved seed quality, mechanization, improved irrigation facilities, fertilizers and pesticides.At a global level, the share of agriculture sector in world economy has been found only 6.40 per cent in 2017 (Table 1). On the other hand, the share of service and industry sectors in world economy has been found 63.60 and 30.0 respectively. Table 1 represents the Real Gross Domestic Product (GDP)sectorial composition of top 10 World economies in 2017. Out of top ten economies of the world, the share of agriculture in gross domestic product is more than 5.0 per cent in India, China, Brazil and Indonesia.

Service sector play an important role in GDP of al 10 top economies in the world. In particular the share of agriculture in GDP has been found highest i.e., 15.29 per cent in India.

Table 1: Real Gross Domestic Product Sectorial Composition of Top 10 World Economies in 2017

Country/Economy	Agricultural (In %)	Industrial (In %)	Service (In %)
World	**6.40**	**30.00**	**63.60**
China	7.90	40.50	51.60
European Union	1.60	25.10	70.90
USA	0.90	19.10	80.00
India	**15.29**	**23.36**	**61.35**
Japan	1.10	30.10	68.70
Germany	0.70	30.70	68.60
Russian Federation	4.70	32.40	62.30
Indonesia	13.70	41.00	45.40
Brazil	6.60	20.70	72.70
France	1.70	20.20	79.20

*Source: Author's calculation based on world bank database (*https://wdi.worldbank.org/)

In India agriculture sector contributes lowest in the economy than other sectors (if we classify economy broadly in primary, secondary and tertiary sector), still agriculture is backbone of Indian economy as almost half of its population rely on agriculture for their lives and livelihood.The sectoral share in Gross Value Added (GVA) in India at constant prices are given in Figure 1 from 2011-12 to 2020-21.

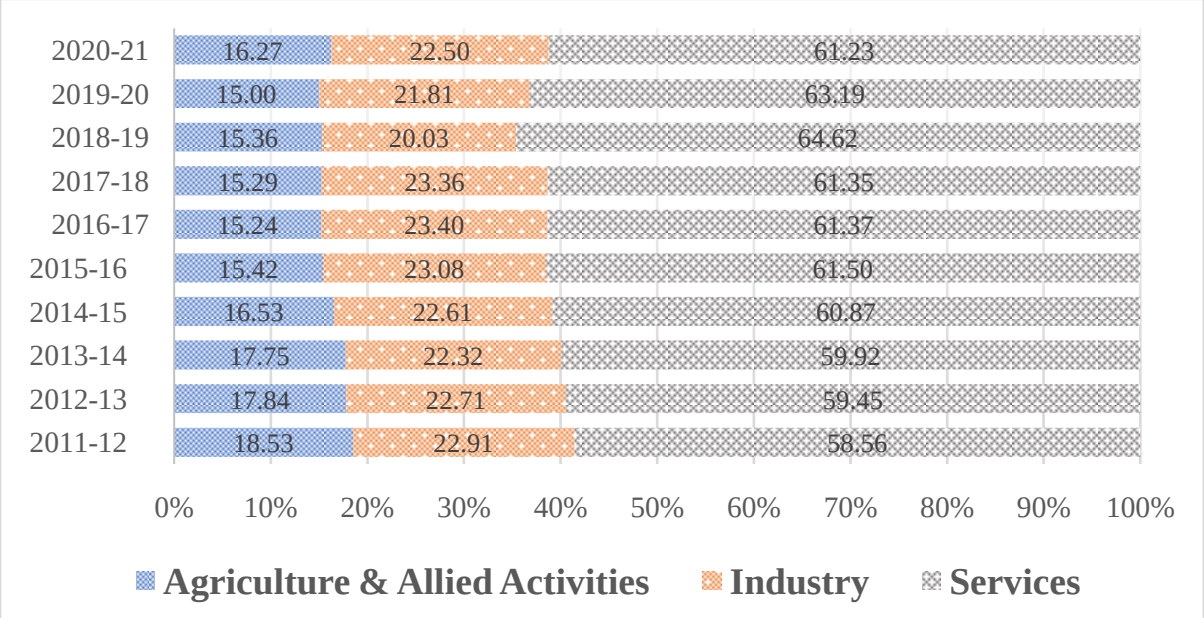


Figure 1: Sectoral share in Gross Value Added (GVA) in India at Constant Prices

Source: Author's calculation based on RBI database, Government of India

Above figure 1 shows the continuous decline of in the contribution of agriculture sector in GVA in India straight from 18.53 percent in 2011-12 to 16.27 percent in 2020-21. However, during Covid-19, share of agriculture sector rises from 15.0to 16.27 percent in GVAduring 2019-20 to 2020-21 and it was agriculture sector, which manages economyin its retarding growth which was -6.6 percent in 2020. This shows its significance in Indian economy.Hence, agriculture sector plays a strategic role and its growth is important for the growth of economy.

Sector-Wise Growth Trends: The sector wise gross value added in India at basic prices and the sector wise compound annual growth rate (CAGR) of Indian economy in terms of gross value added are presented in Table 2. The gross value added of the economy as well as its components viz., agriculture sector, industry sector and service sector has been increased rapidly during last 10 years.The CAGR of agriculture sector, industry sector, service sector and GVA has been found 3.63, 5.91, 6.42and 4.36respectively.During last six year i.e., 2015-16 to 2020-21, the CAGRof agriculture sector is found 4.4 per cent, which is higher than any other sector (industry and service sector) including overall gross value added (GVA) of the Indian economy. This implies the consistent growth in Indian agriculture. In addition, during Covid-19 pandemic, every sector shows declining growth rate due to complete lockdown except agriculture. This shows the sustainable economic growth for agriculture sector.

Table 2 : Components of Gross Value Added in India at Basic Prices (2011-12) (Amount in ₹ Billion)

Year	Agriculture & allied activities	Industry	Services	GVA at Basic Prices
2011-12	15019.47	18576.89	47473.10	81069.46
2012-13	15242.88	19411.17	50808.69	85462.75
2013-14	16091.98	20234.17	54310.34	90636.49
2014-15	16061.40	21970.69	59158.14	97190.23
2015-16	16172.08	24213.02	64520.04	104905.14
2016-17	17260.04	26505.08	69517.72	113282.85
2017-18	18400.23	28116.90	73824.58	120341.71
2018-19	18785.98	24499.54	79052.46	122337.98
2019-20	19823.03	28837.35	83534.38	132194.76
2020-21	20480.32	28315.36	77055.06	125850.74
CAGR (%) (2016-21)	**4.44**	**3.19**	**4.10**	**3.95**
CAGR (%) (2012-21)	**3.63**	**5.91**	**6.42**	**4.36**

Source: Author's calculation based on RBI database, Government of India

The emerging trends of land utilization statistics (LUS), consumption of fertilizers and Pesticides in India during last twenty years i.e., 2000-01 to 2019-20 are presented in the Table 3.

Table 3:Trends of Land UtilizationStatistics, Consumption of Fertilizers and Pesticides in India

Year	Net Sown Area	Gross Sown Area	Net Irrigated Area	Gross Irrigated Area	Consumption of Fertilisers (N+P+K) (lakh tonnes)	Consumption of Pesticides ('000 tonnes)
2000-01	1413.4	1853.4	552.0	761.9	167.0	43.6
2001-02	1407.3	1880.1	569.4	783.7	173.6	47.0
2002-03	1319.4	1738.9	539.0	730.6	160.9	48.3
2003-04	1407.1	1896.6	570.6	780.4	168.0	41.0
2004-05	1406.4	1911.0	592.3	810.8	184.0	40.7
2005-06	1411.6	1927.4	608.4	842.8	203.4	39.8
2006-07	1398.2	1923.8	627.4	867.5	216.5	43.4
2007-08	1410.2	1952.2	631.9	880.6	225.7	41.6
2008-09	1419.0	1953.3	636.4	889.0	249.1	43.9
2009-10	1391.7	1891.9	619.5	850.9	264.9	41.8
2010-11	1415.6	1976.8	636.7	889.4	281.2	55.5
2011-12	1409.8	1958.0	657.1	917.9	277.9	53.0
2012-13	1399.3	1942.5	662.8	922.4	255.4	45.6
2013-14	1414.3	2009.5	681.2	957.7	244.8	60.3
2014-15	1401.3	1983.6	683.8	964.6	255.8	56.7
2015-16	1395.1	1970.5	673.0	966.2	267.5	56.7
2016-17	1394.2	2002.0	686.5	981.5	259.5	58.6
2017-18	1391.8	1999.9	694.8	1000.8	265.9	63.4
2018-19	1393.5	1973.2	715.5	1026.7	272.9	59.7
2019-20	1395.2	1946.5	736.2	1052.6	293.7	61.7
CAGR	**0.01**	**0.41**	**1.44**	**1.72**	**3.03**	**2.27**

Source: Author's calculation based on Ministry of Agriculture & Farmers Welfare database, GOI

The above table3, shows that from 2000-01 to 2019-20 the gross sown area and gross irrigated and net irrigated area, consumption of fertilizers and pesticides has increased. But, the compound annual growth rate of consumption of fertilizers and pesticides is double than net irrigated area. This implies the consumption of fertilizer and pesticides has increased over the years. This also one of the factors of agriculture sector growth. Agricultural growth contributes to environmental degradation also. Green House Gas Emission, deforestation, soil degradation,

Contamination of water bodies, which further leads to hazardous environmental problem. Agriculture sector is responsible for about 17.0 per cent of Green House Gas emission, which is almost same as its share in GDP. Three-fourth of emission is due to methane produced from rice cultivation and livestock and the remaining 26.0 per cent comes from nitrous oxide emitted from fertilizer. However, agriculture itself is one of the major victims of climate change and global warming.Green Revolution, transformed India from a food-deficit nation

to a food-surplus, export-oriented country. However, now the country is facing second-generation problems, especially related to sustainability, nutrition, the adoption of new agricultural technologies and, perhaps most importantly, income levels of the population dependent on farming (Niti Aayog, 2022).

Trends of Shift in Cultivation in India: The trend of shift in cultivation patternin India from 1950-1951to 2020-2021 are shown in Table 4.

Table 4: Trends of Shift in Cultivation in India (Rank of Each Crop in the Total Cropped Area)

Crop	1950-51	1960-61	1970-71	1980-81	1990-91	2000-01	2010-11	2020-21
Coffee	13	13	13	13	13	12	13	12
Condiments and Spices	10	10	10	10	10	10	10	10
Course Cereals or Millets	1	1	1	1	2	2	4	5
Fibres (Cotton & Jute)	6	6	6	6	6	6	6	6
Fodder Crops	7	7	7	7	7	7	8	8
Fruits & Vegetables	8	8	8	8	8	8	7	7
Oilseeds	4	5	5	5	3	4	3	3
Pulses	3	3	3	3	4	5	5	4
Rice	2	2	2	2	1	1	1	1
Sugarcane	9	9	9	9	9	9	9	9
Tea	12	12	12	12	11	11	11	11
Tobacco	11	11	11	11	12	13	12	13
Wheat	5	4	4	4	5	3	2	2

Source: Author's calculation based on RBI database, Government of India

To begin with the crop of the year i.e.,Millets the table shows that there is secular trend of depletion inits position among other crops, staring with 1stposition in 1950-51 it now remains at 5th position in 2020-21 it indicates a rather unsettling pattern of unsustainabilityon both environmental and social front as millets are known for their high nutritional content and their water saving nature.After Green Revolution era,the cropping pattern of India has been changed where Millets has been replaced by cereals crops like Rice and Wheat (Pingali, 2012). In case of Rice which used to be 2nd mostsown crop in 1950-51now in 2020-21holds 1st position. Wheat on the other hand has gained more relative importance among farmers and consumers alike since now it is 2nd most sown crop of India in contrast to it being 5th in 1950-51. Both of these crops and their high yielding variants have been able to provide much needed food security to India, but as much they make up for production, they lack in nutritional value and are known for theirhigh-water consumption which makes them, unsuitable for long term agricultural sustainability. Similar toMillets, Pulsesalso have good nutritional profile and requires relatively less water, butIndia has not been able to keep up

with their production sustainably as pulses slid from 3rdposition in 1950-51 to 4th position in 2020-21. The Table shows that cash crops like Sugarcane, Tobacco and Fibers (Cotton & Jute) had aconsistent performancewith respect to their production which suggests that they are economically sustainable.

On similar lines plantation crops like Coffee,Condiments and Spices were also able to retain their respective positions owing totheir economic sustainability and a high gestation period associated with their production. Economic rewardingCrops like Tea, Oil seeds, Fruits and Vegetables showssatisfactory performanceaccording to the table.to attain agricultural sustainability should be out national priority now more than ever, factors like climate change, over utilization of our limited resources, depleting nutritional profile of our food and depleting soil health due to excessive use of chemical have left us in an agriculturalcrisis.To tackle this forth coming crisis some milestones in agricultural production need to be achieved, thesegoals ranges from minimal resource utilization to high productivity and from food price sustainability to nutritional security. having said that in order to achieve these goals we need better understanding of our crops and cultivation patterns, crops that are economically and environmentally sustainable needs to be prioritized keeping in mind their nutritional profile.

In India, thepopulation is expected to reach 1.64 billion by 2050 with a current decadal growth rate of 17.7 per cent. India's ranking in Global Hunger Index in 2022 is 107th out of 121 countries with the value 29.1, implies serious hunger in the country. This shows the need for high agricultural production. The shift in agriculture from subsistence production to surplus production traced after green revolution, resulted in meeting high demands of agricultural goods, but it has severe negative impact on quality and quantity of resources and environment.The 193 Member States of the United Nations adopted the 17 Sustainable Development Goals (SDGs) of the 2030 Agenda for Sustainable Development in 2015, in which, major goals like zero hunger, no poverty, malnutrition, and climate change are related to agriculture.Food security provides an answer to many of the challenges the world faces in building a sustainable future. Focus on rural development and investment in agriculture - crops, livestock, forestry, fisheries and aquaculture are powerful tools to end poverty and hunger, and bring about sustainable development. Agriculture has a major role to play in combating climate change(Food and Agricultural Organization, UN). Transforming food and agriculture systems to make them sustainable, resilient and inclusive will deliver access to healthy and nutritious foods, help create livelihoods for small-scale producers and processors, and help protect ecosystems and combat climate change. Sustainable agriculture means

meeting the needs of present and future generations for its products and services, while ensuring profitability, environmental health and social and economic equity.

Performance of SDG Indicator Relating to Agriculture Sector in India: Table 4 shows the sustainable development indicator of agriculture in India from 2001 to 2020. Percentage of undernourishment has decreased from 18.40 percent in 2001 to 13.20 percent in 2017 but after 2018, it shows increase and it is 16.30 percent in 2020. Share of government expenditure in agriculture has fluctuation between 6 to 8 percent over the years. Agriculture value added in GDP shows continuous declining trend it was 21.6 percent in 2001 and 16.04 percent in 2019. Water use efficiency in agriculture and overall has increased which implies sustainable use of water resources in agriculture. Overall, Indian agriculture follows the sustainable agriculture development path. National Mission for Sustainable Agriculture Programme was launches by Ministry of Agriculture and Farmer's Welfare to make agriculture more productive, sustainable, remunerative and climate resilient by promoting location specific Integrated/Composite Farming Systems, to adopt comprehensive soil health management practices, to optimize utilization of water resources through efficient water management to expand coverage for achieving 'more crop per drop'.Concept of regenerative farming is also initiated which is holistic farming system that focuses on soil health, food quality, biodiversity improvement, water quality and air quality through methods such as reducing the use of chemical fertilizers and pesticides, reducing tillage, integrating livestock and using cover crops.

Table5: SDG Indicator Relating to Agriculture Sector in India

Year	Prevalence of Undernourishment (%)	Agriculture shares of Government Expenditure	Agriculture value added share of GDP	Agriculture orientation index for government expenditures	Water Use Efficiency [US$/m3] (Agriculture)	Water Use Efficiency [US$/m3] (Total)
2001	18.40	7.66	21.16	0.362	0.19	1.07
2002	20.10	6.70	19.04	0.352	0.20	1.11
2003	21.50	6.79	19.14	0.355	0.19	1.13
2004	22.10	6.51	17.81	0.365	0.20	1.19
2005	21.60	6.80	17.62	0.386	0.19	1.31
2006	19.60	7.62	16.81	0.453	0.17	1.36
2007	17.50	8.67	16.75	0.518	0.21	1.49
2008	16.60	10.35	16.79	0.616	0.23	1.57
2009	16.30	8.69	16.74	0.519	0.24	1.63
2010	15.90	8.51	17.03	0.500	0.25	1.73
2011	15.40	8.42	17.19	0.490	0.27	1.81
2012	14.90	7.58	16.85	0.450	0.29	1.90
2013	14.90	7.24	17.15	0.422	0.31	2.01
2014	14.80	7.44	16.79	0.443	0.33	2.13

2015	14.50	7.09	16.17	0.438	0.35	2.29
2016	13.90	6.65	16.36	0.407	0.37	2.45
2017	13.20	7.47	16.36	0.457	0.40	2.63
2018	13.30	7.54	15.41	0.489	0.43	2.82
2019	14.60	8.57	16.04	0.534	0.43	2.99
2020	16.30	7.52	18.32	0.525	0.46	3.12

Sources: Food and Agriculture Organization (FAO) of the United Nations

ISSUES AND CHALLENGES OF SUSTAINABLE DEVELOPMENT IN INDIA

Indian agriculture sector is a huge occupational that, whether directly or indirectly, affects every person of the country. This industry contributes significantly to the nation's sustained economic growth. Any nation's ability to sustain its agricultural sector depends on its ability to utilize its natural resources in an intelligent, balanced manner. In a developing country like India, where more than half (50.0 per cent) of the population still lives in rural regions and relies mostly on agriculture for their means of subsistence, industrialization nevertheless has a significant influence on the country's destiny.

There are mainly three challenges in sustainable agriculture in India namely;

1. Feeding a growing population,
2. Providing a livelihood for farmers and agricultural labours, and;
3. Protecting the environment sustainability

If we are to make progress that lasts over time in any of these issues, we must address them all simultaneously. However, it is difficult to development on this "triple challenge" because initiatives in one area may have unintended effects in another. Broadly these challenges further categorized into the various sub-categories namely; climate change, protecting environment and revive biodiversity; population dynamics; poor technology and lack of knowledge -fostering global knowledge exchange; fragmented land holding and degraded soil; social sustainability and women led agriculture; agricultural marketing and protect farmer’s interest and policy and management issues.Moreover, the sustainable agriculture provides a much-needed alternative to traditional input-intensive agriculture techniques, which has long-term consequences such as degraded topsoil, diminishing groundwater levels, and decreased biodiversity. In a climate-constrained world, ensuring India's nutrition security is critical.

A good policy at the national level to manage micro agriculture can be very helpful and will address many issues related to sustainable agriculture management. Before moving forward, credit relief for marginal and small farmers is required and should be the first priority. The government can address other issues like electricity and irrigation at multiple levels within a single framework.Moreover, there is need to work on these challenges for ensuring sustainable agricultural development in country like India.These sustainable agricultural development indicators/ goals are given below;

- Defining sustainable development indicators
- Financing sustainable development goals
- Monitoring sustainable development goals
- Measuring progress in sustainable development goals

The vital theme of agricultural development in India is the need to increase productivity, create jobs and provide a source of livelihood for the people. Most of the Food and Agriculture Organization (FAO) studies have shown that the share of small farms in developing countries in agricultural production is 30-35 percent. Adoption of modern technology in India is slow and agricultural practices are too haphazard and unscientific. Now, there is a need to change the food basket toward high nutrition food through the sustainable agriculture. India's sustainable development can also be achieved by fully utilizing human and non-human resources.

OPPORTUNITIES OF SUSTAINABLE DEVELOPMENT IN INDIA

Now, theorganic farming in India accounts for only 2.8 million hectares, or 2.0 per cent of India's net sown area (NSA) of 140.0million hectare. Natural farming is the fastest growing sustainable agricultural practice in India, with around 8 lac farmers practicing it. After decades of consistent promotion, Integrated Pest Management (IPM) has reached a coverage area of 5.0million hectare (CEEW Report, 2021).In India, to meet the demands of diets, livelihoods, and land, ourgoal to have enabled a systematic, urgent shift in our food system by 2030. To achieve this target, we are concentrating on four areas where we feel that our knowledge, experience, and talents can truly make a difference:

- Reconfiguring agriculture value chains so that they are socially just, decarbonized, regenerative, and resilient in the face of disruption and discontinuity;

- Reframing the purpose of agriculture business in the food system. Why and how can businesses step up in driving healthy, affordable, sustainable diets that don't cost the earth?
- Reimagining and reshaping agriculture production landscapes. As our population booms, we need to talk about land.

Regardless of whether agriculture sector of India acts as an engine of economic growth, the sector is extremely important for most developing countries like India. And one thing is certain: agriculture does not stay the same, but changes rapidly. There are many challenges ahead, but also opportunities. The goals of sustainable and inclusive development revealed in the Sustainable Development Goals (SDG) are not easy to achieve. It has become clear that sustainable development means much more than simply overcoming material deficits. Awareness of the need for sustainability has probably never been greater than it is now. However, the true meaning of sustainable development for individual countries becomes clear only when we see how the goals of sustainable development have been realized.

CONCLUSION

The present chapterexamines the performance of Indian agriculture in the context sustainable development along with concept, issues, challenges and opportunities of sustainable agriculture in India. Sustainable agricultural development (SAD) encompasses a wide range of issuesi.e., sustainability of agricultural productivity, sustainability of the farm economy,ecological and environmental sustainability within agricultural systems and rural society sustainability. Now, India become the most populous countryin the world. In order to meet the growing needs of the expandingpopulation, it is bound to produce more nutrition food. In this context, sustainable agriculture is a capital investment because it contributes to the formation of natural capital. It replenishes soil nutrients, water supplies, and the capital of predators and other beneficial fauna. Most agriculture today gradually consumes natural and human capital, removing nutrients, organic matter and water from the soil and reducing human capacity and skills.To achieve social and economic equality in India, sustainable agriculture development must strike a balance between environmental health and economic prosperity. As a result, good management of both natural and human resources is critical. The Indian government has taken several efforts to promote long-term agricultural development.In addition, the progress of sustainable agriculture in India is very slow and its far from mainstream in India. The sustainable agriculture practices and systems (SAPSs), including restructured government support and rigorous evidence generation are necessary

for acceleration the progress of sustainable agriculture development in India.Moreover, restructure government assistance to the farmers by orienting incentives towards resource conservation and rewarding objectives like overall farm production or improved ecosystem services rather than simply outputs like yields or productivity.

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