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SUSTAINABILITY OF INDIAN AGRICULTURE: CHALLENGES AND OPPORTUNITIES

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ABSTRACT:

Agriculture is the single most largest and important livelihood sector for masses in India. International Food Policy Research Institute (IFPRI) released report on Global Hunger. According to that report India has displaced from previous 97th place to 100 in 2017 and the value is 31.4 shows the place of our country found in serious category. The neighbor countries like Nepal, Bangladesh, and Sri Lanka are better in hunger score. Sustainable agriculture is a prime need for developing India for the sustained development. The existing condition of agriculture and trend of various indicator shows future of Indian agriculture which has become very serious.

KEY WORDS – *Sustainable agriculture development, Food grain production, GDP.*

I. INTRODUCTION:

Agriculture is most important private business in India providing income and employment opportunity to more than half of the population. Hon'ble Prime Minister, Shri Narendra Modi while addressing the need for farmer's welfare in his Independence Day speech he rename the name of Ministry of Agriculture as the "Ministry of Agriculture and Farmers Welfare".The Government is aware of the roadmap outlined by NITI Aayog for reforms in agriculture sector and doubling farmer's income up to 2022. Agriculture plays a significant role in India's economy to provide means of livelihood to rural masses.The agriculture sectorcontributes 17% in country's Gross Value Added. Government of India have been taken several steps for sustainable agriculture development. The existing effort like improvement in soil fertility on a sustainable basis through introduced **Soil Health Card Scheme**, '**Pradhan MantriKrishiSinchaiYojana'** for efficient access of irrigation and increased water efficiency. To support organic farming system through the '**ParamparagatKrishiVikasYojana'** and minimization of risk in agriculture sector a new scheme "**Pradhan MantriFasalBimaYojana** has been launched and implemented for Kharif crop from 2016. Sustainable agricultural practices have to balance environmental health and economic profitability in order to promote social and economic equity. Therefore, stewardship of both natural and human resources is very importance. In simple terminology Sustainable Agriculture involves the processes that would enable us to meet the current and long term societal needs for food, fiber and other resources,

Agriculture have been dominant sector in India for economic prediction and the situation will remain same in future. The dependency on agriculture sector has not minimize as proportionate the sectoral contribution of agriculture decline in India's GDP from independence. The dependency of population decline from 75% to 58% but at same time the sectoral contribution fallen from 61% to 17% in the Gross Domestic Product of the country. The comparative picture at world level shows that the share of our population in total world's population is 16.8% but in support only 4.2% water resources and 2.3% land

resources. The world's average of resources availability is four to six time more than our national average. This conditions create pressure on agriculture sector in two way like satisfied primary need of population and diversion of land to non-agriculture uses. The current cropping intensity is 136% which grow 25% from last sixty year. The ground water resources is a dominant water source for agriculture hampered and rich at exit level. All this invers situations negatively influence agriculture productivity in India. So this agrarian nation has need for permanent solution on their existing problem as well as upcoming challenges. Indian agriculture is highly divert sector in case of cropping, climate, availability of natural resources. We have golden opportunity to take advantages of its nature and meet the present and future needs from this sector. For that sustainable agriculture development is a only one way to protect our self in all types of competition. In following discussion we can identified what is the existing condition of Indian agriculture sector, challenges and opportunities.

II. OBJECTIVES OF STUDY:

1. To elaborate the concept of sustainable agriculture.
2. To examine the current situation of India agriculture at various dimension.
3. To identified the existing challenges before India agriculture sector.
4. To suggest the remedial measures and highlight various opportunities for Indian agriculture sector.

III. REVIEW OF LITERATURE:

L.L. Samantaray (2015) in his study titled "A Study on the Current Trend of Agriculture Productivity in India and its future prospects" discusses about the linkage between structural, technical and institutional policy reforms, which are responsible for successive agriculture development. The researcher has collected and analyze secondary data Agriculture, Industry and Service sector, he has explored some major drawback of farm sector in India, and showing to government that it should give priorities to key segments like marketing, price mechanism, research and development. He has been observed that the support of Govt. and privet interference the sustainable growth can be attained. Sangeet, Sukhpal Singh, ShrutiBhogal (2013) in their research study entitled "Agriculture for Sustainable development of India" he traced on Agriculture and compared its different dimensions like employment generation production and productivity, food grain availability. The study shows that more than 60% population has dependent on agriculture which has not sustainably grow. The authors suggest that sustainable development is a vision and that is a time to think about the scare and limited resources and it's used optimally and efficiently for preserving environment.

IV. RESEARCH METHODOLOGY:

This research paper has based on secondary data. The required secondary data for completing the investigation will be collected mainly from published sources in academic libraries, records, books and journals, articles, government report, Economic survey of India, Agriculture census etc. The time series data of selected variables from 2001 to 2018 has used to analyses and conclusion.Researcher will use the important statistical techniques to examine and interpret the data. The various tools such as percentage, Compound Growth Rate, etc.

V. MEANING OF SUSTAINABLE AGRICULTURE:

Sustainable agriculture means production of food, fiber, or other plant or animal products using farming techniques that secure environment, public health, human communities, and animal welfare.

VI. SECTORAL COMPOSITION OF GDP IN INDIA 2000 to 2018:

Indian Agricultureprogress after 2000 is quite low or unsustainable in case of employment opportunity and achieved satisfactory income. The contribution of agriculture in national product has continuously downfall but dependency of population on agriculture sector is remain same. Basically the agriculture sector has root cause of all social and economic problems in the country. Like hunger, poverty,

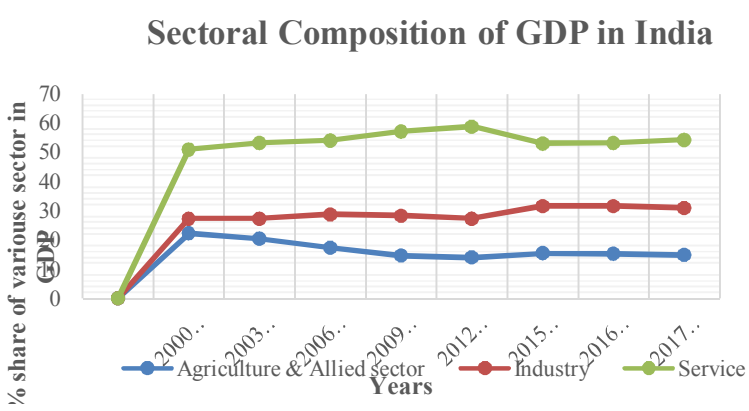
unemployment and so many problem make dip influence on agriculture sector as well as countries economy. The following data elaborate sectoral contribution of three core in India's GDP during study period.

Table No. 1
(2004-05 at constant price)

Years	Agriculture & Allied sector (%of GDP)	Industry (%of GDP)	Service (% of GDP)
2000-01	22.26	27.25	50.98
2001-02	22.39	26.54	51.99
2002-03	20.13	27.39	53.13
2003-04	20.33	27.22	53.25
2004-05	19.03	27.93	53.05
2005-06	18.27	27.99	53.74
2006-07	17.37	28.65	53.98
2007-08	16.81	28.74	54.45
2008-09	15.77	28.13	56.11
2009-10	14.64	28.27	57.09
2010-11	14.59	27.92	57.48
2011-12	14.37	28.22	57.42
2012-13	13.95	27.27	58.79
2013-14	13.94	26.13	59.93
(2011-12 at constant price)			
2014-15	16.5	31.3	52.2
2015-16	15.4	31.6	53.0
2016-17	15.3	31.5	53.2
2017-18	14.80	31.0	54.2

Source: **Economic survey of India 2007 to 2017.**

The contribution of three sectors in countries GDP have different trends. The most important agriculture sector has continuously contributing in GDP from 2000 to 2018 at constant price of 2004-05 and 2011-12. After globalization the LPG policy and WTO agreement has adversely influenced on Indian agriculture sector. The Indian average farmers cannot compete with global competition. The growth of service and industrial sector also one of the causes to minimize the contribution of agriculture in India's Gross Domestic Product. The lack of employment and income opportunity and commercialization of agriculture sector has lost its value or interest of people. From 2012 to 2018 the world agricultural product prices have comparatively low which also impact on agriculture export from India. The rate of net profit in agriculture become negative in case marginal farmers but on the other side they hold 85% share in total farmers. This collective hurdles adversely impact on agriculture sector and cause to decline share in total GDP of India. **Graph No.1**



In the above figure the sectoral composition of India's GDP has describe the share of agriculture, Industry and service during study period. The share of agriculture sector has gradually decline and quite low as compare to other sector. The lack of basic infrastructure development, low rate of investment, use of traditional technology, knowledge of farming. Asymmetric market information, exiting global competition for agriculture product and rate of profit form agriculture sector that all problems became measure hurdles or reason to low growth or less participation in national product.

VII. AREA AND FOOD GRAIN PRODUCTION IN INDIA:

"**Per Drop More Crop**" the slogan given by Prime Minister Narendra Modi highlight the importance natural resources and need of large production. The availability of food grain in India has instantly change after green revolution. The ministry of agriculture in their third advanced estimation disclosed that the total food grain production reach at 279.5 mt.as and also expected 283.7 mt. food grain production in 2018-19 with assume normal monsoon season. But in another side India has upgrade their rank in global hunger index from 97 to 100 in last year. Hunger is serious problem in India, out of 119 countries we are behind the North Korea, Bangladesh and Iraq. Our requirement for food grains in order to provide for our population is projected to be 300 million tunes by 2025-26.The earlier estimate of food grains production in 2017-18 is 277.5 million tones. This implies that the crop output needs to grow more than its annual average. There is marginally increase in the area under food grain production compare to change in total food grain production in India. The average yield agriculture increases because of productive capacity of agriculture sector has uplift during the study period. The following table describe the actual situation of food grain production and area under food grain production in India.

Table No. 2

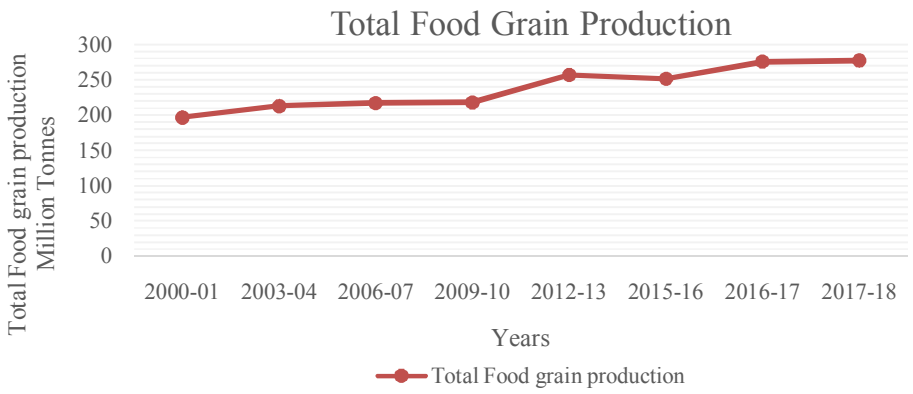
YEAR	Total Food grain production (Million Tones)	Area under Food grain production (Million hectares)
2000-01	196.87	121.05
2001-02	212.85	122.77
2002-03	174.87	113.87
2003-04	213.19	123.45
2004-05	198.36	120.08
2005-06	208.60	121.60
2006-07	217.28	123.70
2007-08	230.78	124.06
2008-09	234.47	122.83

2009-10	218.11	121.33
2010-11	244.49	126.67
2011-12	259.28	124.75
2012-13	257.13	120.70
2013-14	265.04	126.04
2014-15	252.0	122.00
2015-16	251.6	123.21
2016-17	275.68	128.02
2017-18	277.5 (2nd AE)	--------

Source:Economic survey of India 2007 to 2017. RBI web site.

The first and second green revolution has largely influenced on food grain availability in India. In 2001 the total food grain availability is 196.87 mt. The bad monsoon session adversely influenced on availability of food grain in year like 2002-03, 04-05, and 2014-15. After 2015 the trend became positive and gradually increased. In the present year 2018 expected total food grain availability is 277.5 mt. means the net food grain availability increases 81 mt. during the study period. The area under food grain production has marginally increased from 121.05 to 128.02 mt. means only 6.63% increase in total area under food grain production in India. This fact explore the need and opportunity of agriculture sector to expand.

Graph No.2



The trend of food grain production shows that gradual increase in food grain production up to 2012-13. Monsoon adversely influence on food grain production after 2012-13 the trend marginally decline up to 2015-16. With small and marginal holdings constituting 85 per cent of the total holdings, one of the major challenges faced by the Indian economy lies in enhancing the viability of agriculture, the achievement of which could significantly improve the growth prospects of the economy. This poses a threat to the economic viability and sustainability of crop production. Therefore, the goal of long-term food security can be attained only if agriculture is made sustainable through reforms in agricultural policies and agronomic practices.

VIII. PER CAPITA NET AVAILABILITY OF FOOD GRAIN IN INDIA 2000 TO 2018:

The policy for food grain production and its available for masses have huge differences. The food grain availability during 2000 to 2018 has given in the following table. The food grain availability in kilo gram per year and gram per day has given as follows.

Table No.3

Years	Food grains (Kgs Per Year)	Food grains (Grams Per Day)
2000	165.9	454.4
2001	151.9	416.2
2002	180.4	494.1
2003	159.7	437.6
2004	168.9	462.7
2005	154.2	422.4
2006	162.5	445.3
2007	161.6	442.8
2008	159.2	436.0
2009	162.1	444.0
2010	159.5	437.1
2011	170.9	468.2
2012	169.3	463.8
2013	179.5	491.9
2014	178.6	489.3
2015	169.8	465.1
2016	177.7	486.8
2017	178.4	488.7
2018	176.8	484.3

Source: Agricultural Statistics at a glance 2018

The result present table no.4 reveals that 6.16%. growth in food grain availability in India during the period 2000 to 2018. The highest availability of kg. Per year existed in year 2002 and less in 2001. In present year the food grain availability kg. Per year is 176.8. The consider period shows less increase in food grain availability in India. The food grain availability gram per day also increases 8.11% during the study period. This both indicator explore the real task that the production targets should be expand and sustainable increase in availability of food grain to community of India.

IX. CHALLENGES BEFORE INDIAN AGRICULTURE:

The agriculture sector has the most challenging sector in respect of economically, environmentally and socially. The Indian agriculture sector faced various traditional as well as new global challenges the key challenges addressed as follows.

- The conservation and enhancement of ecological foundations for sustainable agriculture, which included land, water, biodiversity, and marine resources. Urbanization and non-agricultural land uses to create tremendous challenge before agriculture.
- The 80 percent farmers in India having small size of land.They are not economically sound and lack of market attachment.
- The net income from agriculture of small and marginal farmer's quite low or some time it become negative. Because of large increase in production cost in agriculture sector.
- The contribution of private sector in agriculture investment quite low and declined trend of public investment in agriculture after 2000.
- The agriculture productivity is very low and hamper income of the farmers. The per unit area productivity also low in case of major crop producing in countries.

- The fall in the ground water level generate more pressure on other irrigation facilities and create hurdles in the way of agriculture development in India.
- Lack of competitiveness in Indian farmers is another hurdles rise in between between improve agriculture development. The farmers are less risk bearing and unskilled which adversely impact on their income from agriculture.
- Natural risk in agriculture is a common phenomenon but most of the farmers not get benefits of crop insurance scheme. The agricultural insurance schemes are inefficient to overcome various risk in agriculture sector.
- Low profitability is a main cause behind thefarmers indebtednessand suicide problem existed in many state of India in the last few years.
- The spending on agriculture subsidy has increased year by year but problem remains same and continuously grow-up.

X. OPPORTUNITY FOR INDIAN AGRICULTURE:

The following key recommendations has given to ensure higher and inclusive growth in Indian agriculture sector.

- Increasing agricultural productivity is a key challenge for ensuring national food security. To increase production, exploiting the potential of existing yield gaps offers a tremendous opportunity
- Rain fed areas have a huge potential to raise production and increase farm income. These grey areas can soon be made green to harness a second green revolution.
- Linking farmers to markets is a pre-requisite for augmenting farm production and farmers' income. Role of innovative institutions would be critical in this context to reap the benefits of emerging opportunities
- There is a dire need to significantly expand the capital investment in agriculture by both public and private institutions in the non-green revolution regions, particularly in the eastern and north-eastern India, where there is a great potential for agricultural growth.
- Water will be the most critical natural resource for the future growth of agriculture. Currently, the water sector for irrigation is invariably neglected both at the central and state levels
- Climate change has added a new dimension to future agricultural growth, which is a major concern. The worst affected would be small farm holders located in the marginal and under-privileged areas.
- There is an urgent need for agricultural diversification by identifying the key crops/ commodities which can help small farm holders to raise their income.
- Food processing and distribution sector needs to be strengthened by evolving policies for larger private sector participation in the entire value chain.
- Globalization of agriculture create huge opportunities for enhanced agricultural production and export.

XI. CONCLUSION:

In short, after the brief discussion on current position of Indian agriculture, the major challenge is to secure sustainability of agriculture. Global warming and climate change all adversely impact on overall agriculture productivity and production in India. The future demand for food grain and raw material will not be satisfied from agriculture sector. Less production from agriculture and expansion in demand create bourdon on agriculture production and food inflation in India. But another side is that the agriculture production, productivity, profitability of marginal farmers has declined. On that ground the sustainable agriculture development is only way to overcome this problem and further development.

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