



A Glance on Sustainable Sugarcane Farming in India

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Abstract: Agriculture is the backbone of our country; sustainable agriculture offers much more needed alternative to conventional input intensive agriculture. The sustainable agriculture impacts long term of which including degrading topsoil, declining groundwater levels and reduced bio-diversity. It is vital to ensure India's nutrition security in a climate constrained world. The sustainable sugarcane farming initiative is an innovative set of agronomic practices process that involves using less seeds and less chemical items, raising seeds in a nursery, and following new planting methods sugarcane farming, with wider seed spacing, and better water nutrient management to increase the cane yields significantly. India is second largest producers of sugarcane in the world. It has been around since support from political generation in Sugarcane cultivation in India. Now a days, sustainable sugarcane farming the country's commitment to renewable energy could be create additional benefits from sustainable sugarcane farming, like conserving natural resources and providing better nutrition to the poor. Sugarcane will be become a increasingly important crop in India due to increasing demand from sugar consumers and an expansion on the use of sugar based bio-fuels. This paper is focus on problems faced by the farmers towards sustainable sugarcane farming and sugarcane farming schemes.

Key Words: Agriculture, Sustainable agriculture, Groundwater, Sugarcane farming

1. INTRODUCTION:

Agriculture is often attributed as the backbone of the India economy as 42% of the workforce depends on the agricultural sector to earn their livelihood. It contributes 19.9% to the GDP, indicating its significance to the country's economy [1]. Agriculture is most important private business in India providing income and employment opportunity to more than half of the population. The Government is aware of the roadmap outlined by NITI Aayog for reforms in agriculture sector and doubling farmers' income up to 2022. Agriculture plays a significant role in India's economy to provide means of livelihood to rural masses. The agriculture sector contributes 17% in country's Gross Value Added. Government of India has been taken several steps for sustainable agriculture development. The existing effort like improvement in soil fertility on a sustainable basis through introduced Soil Health Care Scheme, 'Pradhan Mantri Krishi Sinchai Yojana' for efficient access of irrigation and increased water efficiency [2]. India is become the second largest producer of sugar worldwide. India is the world's largest consumer of sugar. The country's sugarcane industry, second only to cotton in size, relies on more than six million smallholder farmers and countless labourers to produce its sugar. However, sugarcane farming is highly water intensive and recent years have witnessed significant depletion of ground water resources threatening food security, economic growth and livelihoods of the farmers [3]. Sugarcane is an important crop in India. There are 35 million farmers growing sugarcane and another 50 million depend on employment generated by the 571 sugar factories and other related industries using sugar. In Uttar Pradesh, Maharashtra and Tamil Nadu, sugarcane plays a major role in the state economy [4]. India's farmers must be enabled with opportunities and supported with holistic solutions to restore nature farming methods, which will ensure ecological balance through sustainable deployment goals. Improving the economic conditions of farmers needs immediate attention to accelerate the pace of growth. They must be enabled with opportunities and supported with holistic solutions that will help in restoring natural farming methods, which will, in turn, restore the ecological balance through sustainable development goals [5]. This paper is focus on sustainable agriculture, sustainable sugarcane farming, sustainable agriculture and sugarcane production initiatives, sugarcane farming schemes and challenges in sustainable agriculture.



2. REVIEW OF LITERATURES:

Bethu Sudhakar (2016) this paper focused on Sustainable agriculture development in India: Issues and challenges. This study is main objective issues and challenges of sustainable agriculture development in India. The green revaluation may bring the efficiency in agriculture produce and thus productivity increases. This author is concluded as we see the performance of agricultural sector of India we will be easily recognize that performance has been increased in a significant manner over the years. Despite of many challenges like urbanization, growth of secondary sector etc. it is achieved a significant growth.

Dr. Prakash Shankar¹ et.al (2018) this authors discussed Sustainability of Indian agriculture: Challenges and opportunities. This study is main objective to elaborate the concept of sustainable agriculture, to examine the current situation of Indian agriculture at various dimensions, to identify the existing challenges before in Indian agriculture sector, to suggest the remedial measures and highlight various opportunities for Indian agriculture sector. This study is concluded that less production from agriculture and expansion in demand create bourdon on agriculture production and food inflation in India. But on another side, the agriculture production, productivity, profitability of marginal farmers has declined. On the ground the sustainable agriculture development is only way to overcome this problem and further development.

2. OBJECTIVE OF THE STUDY:

This paper is focus on sustainable agriculture, sustainable sugarcane farming, sustainable agriculture and sugarcane production initiatives, sugarcane farming schemes and challenges in sustainable agriculture.

3. SUSTAINABLE AGRICULTURE IN INDIA:

Modern agri-tech firms can be instrumental in empowering farmers, promote sustainable agriculture practices, reduce crop wastages, and deepen domestic and international market linkages along with improving farmer income ^[6]. The virtual advocacy event was designed to facilitate exchange of thoughts and ideas amongst sustainability practitioners, sugar companies, sugar mills local and state government, financial institutions and civil society organization form India, Netherlands and across different parts of the worlds, working on a wide range of issues related to sustainable development, agriculture, water efficiency and business responsibility in the sugarcane sector. The event centered on influencing, advocating and exploring business and policy action strategies for sustainable and inclusive development in India's agriculture sector. The emphasis was on taking learning's from current sustainable initiatives in India to develop recommendations on various thematic challenges, such as ^[7]. Sustainable agriculture has a lot of benefits, from contributing to soil fertility to protecting biodiversity and the ecosystem rather than depleting them ^[8]. The sustainable development in India can also be achieved by full utilization of human resources. A large part of poor population of the country is engaged in agriculture, unless we increase their living standard, overall growth of this country is not possible. If we keep ignoring the poor, this disparity will keep on increasing between classes. Debt traps in country are forcing farmers to commit suicides. People are migrating towards city with hope of better livelihood but it is also increasing the slum population in cities. Therefore, rural population must be given employment in their areas and chance to prosper. India has been carrying the tag of "developing" country for quite long now; for making the move towards "developed" countries, we must shed this huge dependence on agriculture sector ^[9].

4. BENEFITS OF SUSTAINABLE AGRICULTURE:

- Conservation the environment and Preventing pollution:
By adopting sustainable practices, farmers will reduce their reliance on non-renewable energy, reduce chemical use and save scarce resources. Keeping the land healthy and replenished can go a long way when considering the rising population and demand for food ^[10].
- Reducing cost and focus on profit:
Farming smarter and moving food from farm – to fork in a more efficient manner will be beneficial for anyone involved with the agriculture industry ^[10].
- Improving food production without being wasteful:
The anticipated population increase is cause for concern. Today, there is an opportunity to develop agriculture practices from a pure production standpoint and sustainable agriculture is the route with the most opportunity ^[10].

5. SUSTAINABLE AGRICULTURE INITIATIVE:

The future of agriculture in India must not only focus on easing viability of the sector but empowering farmers, who work tirelessly to sustain the agricultural ecosystem from further degradation. Initiatives by the government,



corporate, and community members must be a continuous Endeavour to ensure farmers are resilient. The small Indian farmer, with an increased knowledge of sustainable agriculture practices and support of a proactive community, can turn the wheels of development, and show the way forward for agrarian India ^[11]. ITC has empowered farmers and forged strong relationship with rural communities to enable sustainable sourcing solutions for over several decades. Recognizing that poverty in rural India is primarily a result of the poor capacity of farmers in terms of lack of access to knowledge, information, price discovery, quality agricultural inputs and markets, the Company has devised unique business models for agri sourcing that not only support sustainable agriculture but also contribute to substantial livelihood creation for inclusive development. In addition, ITC's Social Investments Programmes, including integrated watershed development, support the adoption of sustainable agriculture practices ^[12].

6. SUSTAINABLE SUGARCANE PRODUCTION IN INDIA:

Sustainable agriculture offers a much-needed alternative to conventional input-intensive agriculture, the long-term impacts of which include degrading topsoil, declining groundwater levels and reduced biodiversity. It is vital to ensure India's nutrition security in climate-constrained world ^[13]. Sugarcane will become an increasingly important crop in India due to increasing demand from sugar consumers and an expansion in the use of sugar-based biofuels. Sugarcane cultivation needs to change radically in order to increase yields and sustainable meet this demand. The Sustainable Sugarcane Initiative (SSI), initiated by AgSri, is facilitating this transformation with small holders on the ground in the sugarcane growing regions of India ^[14]. Instability in sugarcane production is causing a serious shock to farm income and the supply of sugarcane to the sugar mills. It increases the risk involved in sugarcane production and affects the price stability (Chand and Raju, 2008) and it increases the vulnerability of sugarcane growers. It means variability in sugarcane production that influences the prices of sugarcane and it automatically affects the profit level of sugarcane crop and the rate of labour absorption. The Sugarcane production system would become even more unsustainable when the risk involved and instability are higher. These are the growing concerns about the increased variability in sugarcane production, productivity, and farm income faced by the sugarcane growers and sugar mills. As a result of rapid investment, some changes have taken place in the sugarcane sector in the country as a whole and Maharashtra in particular, and these changes need to be taken into consideration from the sustainability point of view ^[15].

7. SUSTAINABLE SUGARCANE PRODUCTION INITIATIVE:

The sustainable sugarcane Initiative is another practical approach to sugarcane production which is based on the principles of 'more with less' in agriculture like system of Rice intensification. Sustainable sugarcane initiative improves the productivity of water, less seed, land and labour, all at the same time, while reducing the overall pressure on water resources, it is method of sugarcane production which involves using less seeds, no chemical, less water optimum utilization of fertilizers land to achieve more yields. Driven by farmers, SSI is an alternate to conventional seed, waster space intensive sugarcane cultivation. The major principle of sustainable sugarcane initiative includes Raising nursery using sinle budded chips, Transplanting young seedling (25-35 days old), Maintaining wide spacing (5x2 feet) in the main field, Providing sufficient moisture through water saving efficient irrigation technologies viz., Skip furrow, alternate furrow and subsurface drip irrigation and Practicing intercropping with effective utilization of land sustainable sugarcane initiative. Along with water management initiatives like Produce more per mm of water and all other inputs, Raise cane crop even under marginal land, Raise crop in problem soils and water and minimum tillage, Create micro catchments for water harvesting and Multi-ratooning and Produce higher cane yield with less water ^[16].

8. SUSTAINABLE AGRICULTURE CHALLENGES:

In agriculture, sustainable farming is becoming the need of the hour the world over. India is still struggling with food security. According to data from the Food and Agriculture Organization (FAO), more than 190 million of the Indian population remains hungry on a daily basis. The challenges for the required dramatic improvement lies in the inept rural transport system, need for awareness regarding crop treatment, dependence on irregular monsoons, and the receding agricultural land giving way to urbanization. The Indian farmer's access to modern farming technology is also limited ^[17]. The central issue in agricultural development is the necessity to improve productivity, generate employment, and provide a source of income to the poor segments population. Studies by FAO have shown the small farms in developing countries contribute around 30-35% to the total agricultural output. The pace of adoption of modern technology in India is slow and the farming practices are too haphazard and unscientific. Some of the basic issues for development of Indian agriculture sector are revitalization of cooperative institutions, improving rural credit, research, human resource development, trade export promotion, land reforms and education ^[18].



9. SUSTAINABLE AGRICULTURE SCHEMES:

Agriculture is one of the prominent sectors of Indian economy providing livelihoods to more than half of India's population. While providing food security, this is backbone of the country's rural economy. In the first quarter of FY 2020-21, when the Indian economy recorded 23.9 percent negative growth, agriculture was the only sector which emerged as a silver lining for India's economic recovery with over 3.4 percent growth^[18].

- **National Mission For Sustainable Agriculture (NMSA)**

In order to make agriculture more productive, sustainable, and remunerative and climate resilient, the Government of India introduced National Mission for Sustainable Agriculture (NMSA) in the year 2014-15. To achieve these goals the mission promotes location specific sustainable and best farming practices; soil conservation and moisture protection measures; soil nutrient management; efficient and sustainable water management practices with mainstreaming rain-fed methods. As a major component of the mission, 'On Farm Water Management' (OFWM) is being implemented with the objective increasing water use efficiency by promoting modern technologies such as micro irrigation and sustainable waste management practices, efficient water consumption, better distribution channels along with secondary storage facilities^[18].

- **Pradhan Mantri Fasal Bima Yojana (PMFBY)**

The extreme weather conditions such as droughts, floods and hailstorms cause crop failures and financial loss to the farmers every year. And therefore, to save them from these ill effects, the Government, by merging all previous crop insurance schemes, launched Pradhan Mantri Fasal Bima Yojana (PMFBY) from Kharif 2016 season with the aim to support production in agriculture by providing an affordable crop insurance system^[18].

- **Pradhan Mantri Krishi Sinchai Yojana (PMKSY)**

The Government of India has structured Pradhan Mantri Krishi Sinchayee Yojana (PMKSY) with the vision to extend the coverage of irrigation and improving water use efficiency in focused manner. PMKSY focuses end to end solution on source creation, distribution, management, field application and extension activities. The Centre has structured the scheme with merging previous irrigation and water management programmes such as Accelerated Irrigation Benefit Programme (AIBP), Integrated Watershed Management Programme (IWMP) and On Farm Water Management (OFWM) Scheme^[18].

- **Paramparagat Krishi Vikas Yojana (PKVY)**

Paramparagat Krishi Vikas Yojana (PKVY) is one of the important government schemes which encourage farmers for traditional and organic farming in India. Under the Scheme, the Government of India provides a financial assistance to the farmers of Rs 50,000 per hectare every three years for organic inputs, certification, labeling, packaging, transportation and marketing of organic produce. The scheme focuses on reducing the ill effect overuse of fertilisers and agrochemicals by promoting organic manures, bio-fertilisers and bio-pesticides^[18].

- **Micro Irrigation Fund Scheme**

National Bank of Agriculture and Rural Development (NABARD) has created a Micro Irrigation Fund with a corpus of Rs. 5,000 crore implemented from 2019-20. The objective of the fund is to facilitate the states in availing an interest sub-subsidized loan for expanding converge of micro irrigation facilities by taking up special and innovative projects and also for incentivizing micro irrigation beyond the provisions available under PMKSY to encourage farmers to install micro irrigation systems^[18].

- **Mission Organic Value Chain Development for North Eastern Region (MOVCDNER)**

MOVCDNER aims to develop the certified organic production in a value chain mode to link farmers with consumers and to support the development of entire value chain starting from organic input, seeds, certification and creation of facilities for collection, aggregation, processing, marketing and brand building initiatives^[18].

- **E-NAM**

In order to connect the existing agricultural mandis on a common online market platform for trading agricultural commodities, Government of India, launched a pan-India portal, e-National Agriculture Market (eNAM) on April 14, 2016^[18].

- **Kisan Credit Card (KCC)**

In a bid to provide adequate and timely credit to the farmers for their agricultural expenditures, the Central government had launched Kisan Credit Card (KCC) scheme in the year 1998. Under the scheme, the Government of India provides farm credit at a very subsidized rate of 4 percent per annum. Since 2019, the Centre has extended the benefits of Kisan Credit Card to animal husbandry, dairy and fisheries farmers for their



working capital requirement and raising the existing limit of collateral free loan from Rs. 1 Lakh to Rs. 1.60 lakh ^[18].

- **Soil Health Card**

The objective of conserving and maintaining soil nutrient and soil fertility, soil Health Card (SHC) Scheme issues soil health cards to the farmers every two years to provide a basis to address nutritional deficiencies in the fields. Under the scheme, soil testing is conducted to analyse the nutrient needs, then crop-wise fertilizers are recommended accordingly. This reduces cultivation cost by application of right fertilizers with right quantity ^[18].

- **PM Kisan Samman Nidhi Yojana**

Lunched on February 24, 2019, PM Kisan Samman Nidhi Yojana makes transferring of Rs.6,000 per annum directly to the farmers bank accounts through Direct Benefit Transfer (DBT) in three installments of Rs 2,000 each. The scheme supplements the financial needs of the small and marginal farmers in buying farm inputs and other agricultural expenses, The scheme aims to protect the farmers from falling in the vicious traps of local moneylenders and ensure their continuance in the farming activities ^[18].

- **PM-Kusum**

In order to reduce the consumption of diesel and electricity for agricultural irrigation, the Cabinet Committee on Economic Affairs (CCEA) approved Pradhan Mantri Kisan Urja Suraksha Evam Utthaan Mahabhiyaan (PM-Kusum) scheme in February 19, 2019. With a total Central financial support of Rs.34, 422 crore, PM Kusum scheme aims to add solar and other renewable capacity of 25,750 MW by 2022 ^[18].

10. CONCLUSION:

Sustainable agriculture is a lot of benefits, from contributing to soil fertility to protecting biodiversity and the ecosystem rather than depleting them. The burgeoning sustainable sugarcane farming puts considerable pressure of sugar industry employment the food system, which this makes adopting sustainable sugarcane farming to meet present needs to compromising the ability of future generation's sustainable sugarcane farming to their needs. Additionally, our commitment to regulate and enhance sustainable sugarcane farming output, maximize farmers income, and raise awareness about to be developed in sustainable agriculture needs to ensure the sector's overall sustainability in the long run.

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