
Environmental Aspects of Sugarcane Farming in India: Challenges and Solution for Sustainable Cultivation

Dr. Neha Goswami

Assistant Professor, Satyawati College (Eve), DU

E-Mail- goswamineha13@gmail.com

ABSTRACT

Sugarcane plays a significant role in Indian agriculture because, sugarcane ranks second in the world production. The present study tries to focus on the different environmental problems faced by the sugarcane farming in India and also suggested some remedial measure to overcome with these problems. The objective of this study is to know the role of the environment in the cultivation of sugarcane and the problems faced by the farmers. The paper has collected the information from the different reports of ISMA (Indian Sugar Mill Association), different website and the books related to the sugarcane and sugar production. There will be a chart that helps us to understand the sugarcane diseases. The sugarcane farming loss will actually be the nation's loss because the sugarcane loss of farmer's is due to different factors like poor quality seeds, low variety of yield, which will adversely affect the sugar mills in the form of less begasse, bad quality juice, and increase in molasse. So, it is important to analyse the problems faced in sugarcane farming. The paper will also provide different measures to be adopted by the agriculture sector for sugarcane farming.

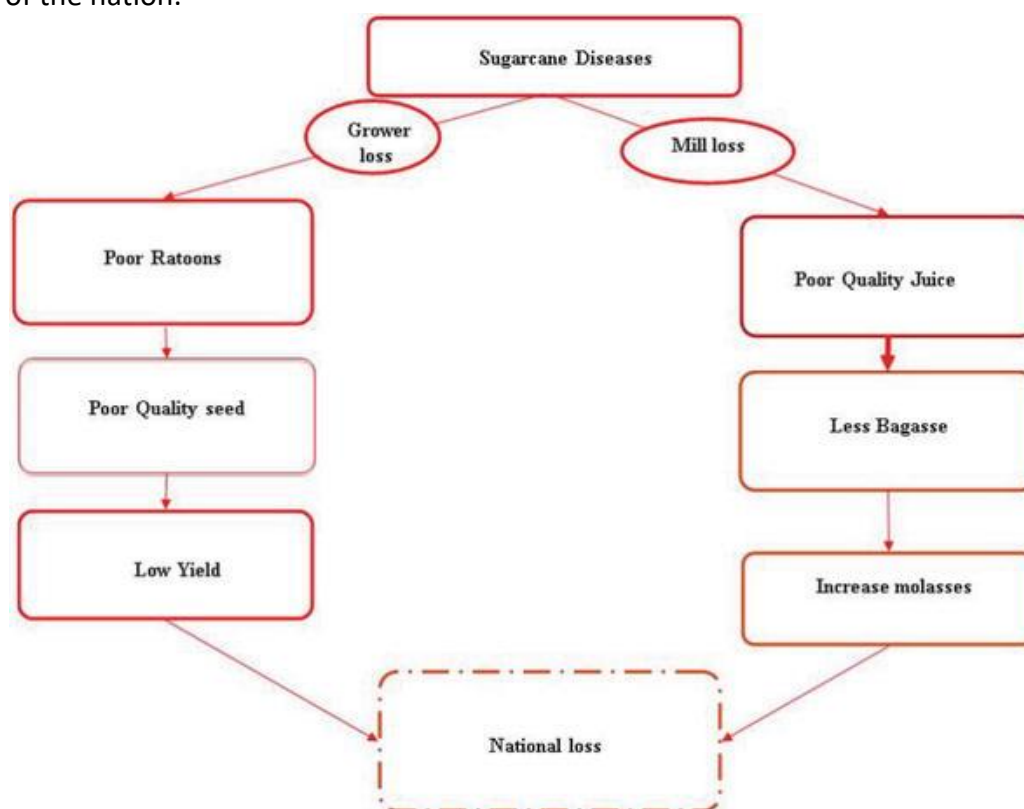
KEYWORDS: Environment, Sugarcane Cultivation, Indian Economy, Sugar Industry

INTRODUCTION

In India, sugarcane production plays an important role in the growth of the rural sector as well as the development of the Indian economy. Sugarcane is the major input that is used for the production of sugar all across the world. India is the second-biggest producer of sugarcane after Brazil. There are around 35 million farmers who are engaged in the production of sugar and this is almost 7% of the rural population. Sugarcane is the crop that is also used for the production of bio-energy in India. In India sugarcane is also a major commercial crop. The production of sugarcane affects the production of sugar and its by-product like ethanol. Both of them play a big role in the socio-economic development of the country. There is a continuous increase in the production of sugarcane in India. There are various problems faced by the farmers to produce the sugarcane that includes timely payment of their cane value by the sugar mills, uneven weather conditions, improper water supply, bad forecasting system, etc. But the main challenge which is faced by the sugarcane growers is the degradation of the environment. The sugarcane production also gets affected by the change in climate, fluctuation in rainfall, decline in the fertility of the soil, inappropriate supply of water, excess use of pesticides, water pollution created by the industries, and stress of drought, etc. Water plays a major role in the production of

sugarcane. The production of sugarcane requires a very long time and it covers almost all the seasons i.e. summer, rainy, and winter in their life cycle. The production of sugarcane is done in tropical areas which are very hot. In India, there are various regions where sugarcane cultivation is high like Tamil Nadu, Maharashtra, Madhya Pradesh, Andhra Pradesh, Gujarat, Goa, Karnataka, Kerala, and Pondicherry. For sugarcane farming water also plays a big role as it requires 250 tonnes of water for the production of 1ton of sugarcane only. The production of sugarcane is adversely affected by the changes in the weather condition. Nowadays it becomes important to study the increase in temperature which is affecting the sugarcane yield most. The sugar sector is also gets affected by the different policies started by the government for sugarcane. But they do not consider the environmental degradation impact on sugarcane farming.

The sugarcane farming loss will actually be the nation's loss because the sugarcane loss of farmer's is due to different factors like poor quality seeds, low variety of yield, which will adversely affect the sugar mills in the form of less begasse, bad quality juice, and increase in molasse. As we can see in the chart that the disease in sugarcane yield will result in the loss of the nation.



So for this, it becomes necessary to focus on the role of the environment in sugarcane farming because sugarcane is the major raw material for other finished products like sugar, alcohol, and the generation of electricity.

REVIEW OF LITERATURE

- **Duli Zhao and Yang-Rui Li:** in his study, he examines the process of sugarcane farming and explains that production of sugarcane that gets affected by the change in climate conditions and due to this the production of other goods like sugar and alcohol also gets affected as sugarcane is the major input to produce them. In this paper, he gave the idea of how sugarcane production will respond to the changing weather conditions. According to him, the production of sugarcane in the world's best ten countries, the difficulties faced by the sugarcane sector, and how to tackle these problems.
- **Sagar D.S.I., Mr. Mishra A.K. (2016)** The results showed that manual harvesting (98.47 Rs./ton) is more costly than mechanical harvesting (54.28 Rs./ton). It would suggest that the Bhima Sugar Factory and other sugar factories in Pune can increase mechanical efficiency. Mechanical sugarcane harvesting has an additional competence to cut the sugarcane faster in relation to the manual. Therefore, in India, it is necessary to use a harvester of sugarcane to produce sugarcane products just because less time is taken by the harvester to cut sugarcane and this can cut sugarcane into mini size to facilitate greater transport in bulk.
- **Ashok Kr. Srivastava and Mahendra Kr. Rai:** in their paper, they focused on sugarcane production and how it gets affected by the change in climate and also provides the solution to tackle this problem. He also suggested different measures to increase the soil fertility and the component which are affecting the most in sugarcane farming. He also recommended that in sugarcane farming we need to prepare the land for cultivation.
- **D.Venktesh & M Menkaswashu (2015)** in his paper the author gave an overall idea of the sugar sector of India. This sector is also very important because it provides direct employment to around 7.5 percent of the workforce in India. Indian sugarcane and sugar production also has a major impact on the world market as it provides 25 percent of sugarcane and 15 percent of sugar in the world market.
- **Saleem Hussain and et.Al:** in this study, they focused on the effect on sugarcane farming with the changing environmental situation and because of this how much sugarcane quality gets affected. In this, he also focused on the problems faced by sugarcane farming due to the decline in soil fertility, different diseases of soil, insects and weed problem, etc. They also concentrated on the problem of increasing temperature and how it is affecting the production of sugarcane and how to tackle sugarcane farming with this increasing temperature.

STATEMENT OF THE PROBLEM

The sugarcane sector plays an important role in the overall development of the rural sector and the Indian economy. This sector provides the raw material to the major sector of the Indian economy i.e. sugar. This sector faces many problems in which the role environment in sugarcane farming is the major concern in the present scenario and there is an urgent need to focus on the consequences of the environment on the farming of sugarcane.

OBJECTIVES

- To study the role of the environment in sugarcane farming.
- To examine the problems faced by farmers for the cultivation of sugarcane.
- To give the remedial measures for solving the problems of sugarcane cultivation.

RESEARCH METHODOLOGY

The paper is mainly dependent on the secondary data. The information is collected by reviewing the present literature. The paper has collected the information from the different reports of ISMA (Indian Sugar Mill Association), different website and the books related to the sugarcane and sugar production. The process of sugarcane diseases will be shown with the help of a chart. This study discusses the different problems of sugarcane cultivation due to the environment and other aspects of farming. And the study also provides suggestions and remedial measures to handle these problems.

DISCUSSION AND ANALYSIS

The role of the environment plays a significant role in the sugarcane production. The production of sugarcane is majorly dependent on the environmental condition which includes proper rainfall, proper sunlight, and temperature etc. For the production of good quality sugarcane, it is necessary to have a good variety of yield. There are various components that affect the productivity of yield and these components are as follows:-

- **AVAILABILITY OF HIGH YIELD VARIETY:** the availability of a high variety of seeds is also a major challenge for increasing the productivity of sugarcane. There is a problem of availability of high variety yield that is suitable to handle in every situation whether it is in the draught, control the pest diseases, and that handle the salinity. These varieties are used maximum in foreign countries. The most promising sugarcane variety is fuzz, by the use of this variety the productivity of sugarcane has shown very high growth. It has been seen that the productivity of sugarcane and recovery of sugar is high where the different variety of yield is being used by the farmers.
- **IRREGULAR RAINFALL:** the next major problem for the production of sugarcane is the irregular rainfall which is the main input for the production of sugarcane. For a good variety of sugarcane, it is necessary to have enough amount of water. This also a reason for the improper length and development of sugarcane sticks. Apart from the improper rainfall, there is a lack of management in utilizing the rainwater for sugarcane harvesting.

- **PROPER SUNLIGHT:** the growth of sugarcane and the development of sugarcane sticks depend highly on the photosynthesis for which sunlight is mostly required. The radiant energy of the sun increases the growth of sugarcane production.
- **POLICY OF THE GOVERNMENT:** government policy for the sugarcane also affects the production of sugarcane. The farmer demands, the high minimum prices for the sugarcane and fast recovery of sugarcane arrears from the mills that have led the farmers to take more loan and inefficient to produce more sugarcane.
- **AVAILABILITY OF WATER:** water plays a very significant role in the production of sugarcane. The major stress in sugarcane farming that affects the agriculture sector most is the problem of drought. In drought time, it becomes very difficult to supply enough water for sugarcane production. Improper Rainfall is also one of the problems in the sugarcane sector and the rainfall is also not regular and sufficient to make water available for farming. From July to September, it is the peak time in which around 70 percent of the yearly rainfall happens. The lengthening and development of sugarcane depend on the availability of sugarcane. The lengthening and development of sugarcane also get negatively affected when there is an inadequate water supply. In the dry season, the harvest encounters moderate development that brings low stick yield.
- **PROPER TEMPERATURE:** the role of proper temperature is also very important for the production of sugarcane. Throughout the planting season of sugarcane, the yield goes through the different temperature. If the temperature is between 21-27 degrees celsius then there will be good growth of sugarcane. But if the temperature goes beyond this, then there will be a negative impact on the growth of sugarcane production.

All these are the difficulties faced by sugarcane farmers in the production of sugarcane. All the problems have inversely affected sugarcane farming and there are different measures adopted by the agriculture sector to handle all these problems. These remedial measures are as follows:-

- **PREPARATION OF FIELD FOR PLANTATION:** this is the main step for the production of a good variety of sugarcane. In this, the cleaning of the field is done, which includes removing the left-outs of the previous sugarcane crop. In this, the tillage is being done by the use of ploughing , sub-soiling, harrowing, etc. This step also includes leveling of the land for uniformity in sugarcane farming and this step is also necessary for the equal water supply in the whole area.
- **MANAGEMENT OF WEED:** weed is one of the major factors which is responsible for the damage of yield and can destroy the maximum production of sugarcane. Sugarcane production is a long process and because of this, it has to face the

different kinds of weeds in almost all seasons. Weed reduces the potential of sugarcane and its other nutrients by almost 25 to 90 percent of the whole crop. So it is important to manage the weed for the better productivity of sugarcane.

- **MANAGEMENT OF SOIL AND ITS NUTRIENTS:** managing the soil and its nutrient plays a crucial role in the development of good sugarcane sticks. Because of the poor management of the soil, results in degradation of land which further decrease the nutrients of the soil. So it is mandatory to apply all the practices for increasing the nutrients in the soil like the texture of the soil, composition of the soil, and knowing the variety of the soil.
- **PATTERN OF PLANTING SUGARCANE CROP:** this is also one of the important measures to improve the productivity of sugarcane. In this different planting pattern of sugarcane are being used to increase the productivity of the sugarcane. The various methods which are adopted by the farmers are Rayungun method, Trunch method, field method and practice of using flatbeds etc. In all these methods field method is the cheapest method and mainly used for the areas where the rainfall is very less. In India, central and northern area this method is majorly used.
- **MANAGEMENT OF IRRIGATION:** this also a major step to increase the productivity of sugarcane and with the proper management of the irrigation of sugarcane the productivity can be increased. For the irrigation of sugarcane water plays a big role, so providing an adequate amount of water for cane cultivation is an important step. If there is a shortage of water in the soil, then this will affect the cane quality and there will be moisture stress in the soil. Because of the shortage of water supply, the sugarcane plant faces the problem of stalks in cane.
- **CONTROL IN INSECTS AND PEST:** this is the major concern of sugarcane cultivation because if we do not focus on this the whole production could be destroyed by the pest and insects in the crop. So it becomes important to control them on time while planting the sugarcane. There are more than 200 insect species in India and few of them are very dangerous for agricultural produce. The major insects are termites, pyrrilla perpusilla, borers, black bugs, and whitefly etc. Thus, it is necessary to control these pests and insects for increasing the growth of sugarcane crops.

CONCLUSION AND SUGGESTIONS

Therefore, it is concluded that the environment has a very important role in the growth of the sugarcane sector. The growth of this sector plays an important role in the development of the Indian economy. This sector provides raw material to the biggest industry of India, which is the sugar industry and the ethanol industry. Both of them have a very crucial role in the country. In this paper, we have focused on the major problems of sugarcane cultivation that are faced by the farmers. The main challenges for cultivation include the availability of water, the requirement of proper rainfall, the requirement of proper sunlight, different

policies adopted by the government for the sugarcane sector, availability of a high variety of seeds and proper sunlight for the growth of sugarcane. All these problems are creating a hurdle for the growth and development of sugarcane sticks. Thus, the problems need to be tackled and different measures to be adopted for the growth of sugarcane farming. The suggestions for the growth of this sector includes different measures to be adopted by the agriculture sector that includes preparation of the field for the farming, proper management of weed, management of soil nutrient for the good quality of sugarcane, adoption of different planting pattern for the sugarcane so that the productivity can increase, proper irrigation management, and control on the pest and insects that are found in the crops which are very dangerous for the growth, even they can destroy the maximum production of sugarcane.

Thus, if we adopt these measures for handling the problems of sugarcane cultivation, then the productivity of sugarcane will surely increase.

REFERENCES

- ✓ ASHOK K. SRIVASTAVA¹ , MAHENDRA K. RAI² Review: Sugarcane production: Impact of climate change and its mitigation B I O D I V E R S I T A S ISSN: 1412-033X Volume 13, Number 4, October 2012 E-ISSN: 2085-4722 Pages: 214-227 DOI: 10.13057/biodiv/d130408DOI: 10.13057/biodiv/d130408
- ✓ Duli Zhao¹ and Yang-Rui Li² Climate Change and Sugarcane Production: Potential Impact and Mitigation Strategies Review Article | Open Access Volume 2015 | Article ID 547386 | 10 pages | <https://doi.org/10.1155/2015/547386>
- ✓ Sadam Hussain, et al. Sugarcane Production under Changing Climate: Effects of Environmental Vulnerabilities on Sugarcane Diseases, Insects and Weeds.
- ✓ **Mr. Sagar D.S.1, Mr. Mishra A.K 2016 IMPROVED HARVESTING SYSTEM FOR SUGAR INDUSTRY IN INDIA (ICRTSM-16) ISBN:978-93-86171-12-2**
- ✓ D. Venkatesh & M. Venkateswarlu(2017) An overview of the Indian Sugar Industry BIMS International Journal of Social Science Research, ISSN: 2455-4839
- ✓ Prof. Satish Naykinde 2017 CSFS in Maharashtra Growth, Development and Cost Increasing Tribulation International Journal of Innovative Science and Research Technology ISSN No: - 2456 – 2165 Volume 2, Issue 7, July– 2017
- ✓ Sathyanarayana Rao, Mahesh Gowda (2017) Prevention of farmer suicides: Greater need for state role than for a mental health professional's role-PMCID: PMC5419010, PMID: [28529352](https://pubmed.ncbi.nlm.nih.gov/28529352/)
- ✓ Dr.K.SELVARAJ & S.ANANDH 2018 A STUDY ON PRODUCTION AND MARKETING PROBLEMS OF SUGARCANE PRODUCERS IN ATTUR TALUK, SALEM DISTRICT ISSN: 0975-9999 (P), 2349-1655(O) Volume. IX, Issue 39
- ✓ <https://www.agrifarming.in/sugarcane-farming-for-guide-beginners>