



## Research Article

# BIO- PHYSICAL CONSTRAINTS ENCOUNTERED BY THE SUGARCANE GROWERS IN ADOPTION OF SUSTAINABLE SUGARCANE INITIATIVE (SSI) TECHNOLOGY

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**Abstract:** Sugarcane is one of India's primary commercial crops. It is grown under a range of agro-climates. Cane growers now face endless problems in low yield sugar cane production, varietal degeneration, high input costs, disease and pest incidence, soil erosion, salinity, water logging and drought, and the area under sugar cane is dwindling. In this view the study vividly explained about one of the objectives of constraint faced by the sugarcane growers in Cuddalore District of Tamil Nadu, India. But at present the production of sugar cane is in crisis. At this point, the innovated "Sustainable Sugarcane Initiative" (SSI) technology was introduced as the primary option to rectify the problems in recent decades in the cultivable area to address many of the problems in open fields. The study interview conducted in the year of 2019 with well-structured interview schedule and the result concluded that the bio- physical constraints encounter of the sugarcane growers on SSI was ranked as follows, Inundation due to floods, Non-availability of quality setts, Complexity of new practices, Non-availability of micronutrients at the right time and Uncertainty of canal water for irrigation respectively. Views and opinions furnished by sugarcane growers included in the study were encountered in the adoption of recommended SSI technology in the Cuddalore District from the aspect of bio- physical constraint views and opinions of the whole population of the study area.

**Keywords:** Bio- Physical constraints, Sugarcane Growers, SSI Technology

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## Introduction

Sugarcane dominates a prominent place on India's agricultural map covering extensive areas in the subtropics and tropics. There were 538 sugar mills in the country in 2014-15 compared to 139 mills in 1950-51 and the sugar cane acreage increased from 1, 71 million ha in 1950-51 to 4, 90 million ha in 2015-16. Based on the problem statement of sugarcane there is hardly any possibility of additional land, primarily due to rising agricultural land availability, the industrial farming of sugarcane has contributed to a major decline in productivity of Cuddalore District of Tamil Nadu, India. It is obvious that, in the future, the sugarcane production requirement must be achieved primarily by increasing the crop productivity is a necessity in the region. The water requirements vary considerably from 1200 to 3000 mm depending on the yield level of the crop and the climatic conditions prevailing in different regions of the Cuddalore District. But at present the production of sugar cane is in crisis and the cane growers now face endless problems in low yield sugar cane production, varietal degeneration, high input costs, disease and pest incidence, soil erosion, salinity, water logging and drought, and the area under sugar cane is dwindling. At this point, the innovated "Sustainable Sugarcane Initiative" (SSI) technology was introduced as the primary option to rectify the problems in the region of the recent decades in the cultivable area to address many of the problems in open fields. It also breaks harvest times and provides a longer period of the cane crushing season for the sugar industry in the zone. The study objective of the bio- physical constraints faced by the sugarcane growers during the adoption of the SSI technology in Cuddalore District were emphatic and illustrated clearly. The researcher felt that the study would be of much useful to the Government, foreign donors, international development agencies, private enterprises, banks, universities and to the intellectuals of the country, including the key decision makers at different tiers of the government to get a clear picture and up to date information about sugarcane growers of our

country. This will also be helpful to formulate a pragmatic welfare biased dynamic sugarcane policy/program for the country.

## Material and Methods

Cuddalore District is one of the major sugar cane areas which occupies 21,628 hectares in the year of 2016- 2017 as noted by The Department of Economics and Statistic in Chennai. The list of SSI Sugarcane growers in the Cuddalore District in the selected taluks were obtained from the respective sugar mills in the district and the sample size was selected by the largest population of cane growers. In research, the researcher should keep in mind that the sample size should be taken optimum sample with respect to population size, which fulfils the representativeness, reliability, flexibility and cost effectiveness. The information collected from sample size respondent represents the information from total population. Statistically, the maximum 30 percent is taken from a small population, but for moderate population, 5 percent and 10 percent are taken. Hence, the researcher convenient of this study, 10 percent of total population size was taken in the total highest sugarcane populace of the District. The total population size (N) is 2400 therefore, the sample size (n) was taken 10 percent of the total population (N) which is 240 households from the total household population. Three Taluks, namely Chidambaram, Bhuvanagiri and Kattumannarkoil under the MRK Co-op Sugar Mill divisions, Three Taluks namely Cuddalore, Punruti and Kuringipadi under the EID Parry Sugars (P) Ltd. Divisions. Two Taluks, namely Vridhachalam and Tittagudi under the Ambiga Sugars P) Ltd. divisions, totally all the eight taluks in the Cuddalore district were selected for this study. The study was conducted in the year of 2019 with a well-structured interview schedule was utilised to collect the data and information through the direct contact method by interviewing the 240 respondents and the collected data are interpreted with analysing the appropriate statistical tools to generate the accurate results.

## Findings and Discussion

### Constraints in Adoption of SSI Technology as Reported by The Respondents

In this part the constraints encountered by the experienced sugarcane growers in their non-adoption of the SSI technology in sugarcane cultivation.

In accordance with the objectives, the constraints experienced by the respondents of various locations are presented under the head namely, Bio-physical constraints. The results are presented in [Table-1].

Table-1 Bio- Physical constraints faced by the respondents in adoption of the SSI technology of sugarcane cultivation

SN	Constraints	No.	%	R
Bio-physical constraints				
1	Uncertainty of canal water for irrigation	100	41.67	V
2	Inundation due to floods	220	91.66	I
3	Complexity of new practices	140	58.33	III
4	Non-availability of micro nutrients at right time	102	42.50	IV
5	Non-availability of quality setts	152	63.33	II

### Bio-physical constraints

It could be vividly observed from the Table that altogether five bio-physical constraints were expressed by the respondents with regard to adoption of recommended SSI technologies in sugar cane. Among the five bio-physical constraints, inundation due to floods was the most important constraint mentioned by most (91.66 percent) of the respondents. During rainy season, the farmers used to face uncertainties like heavy rainfall and floods which would cause inundation in the fields. This condition would have prevented the farmers to maintain the condition of alternate wetting and drying. Moreover, it may be due to the climate and location of the study area. These may be the reasons for the above-mentioned constraint. This result coincided with the result of Lakshminarayan *et al.* (2009) [1].

'Non-availability of quality setts' as an important constraint was reported by 63.33 percent of the respondents. This may be due to the inadequate availability of quality setts in the local sett's producers at village level. This finding is in agreement with the earlier findings reported by Reddy (2003) [2], Palanisamy and Sriram (2001) [3].

'Complexity of new practices' was an important constraint reported by 58.33 percent of the respondents. The adoption of new practices might require special knowledge and specialized skills in operating weeder, usage of Marker and maintaining the field with alternate wetting and drying. Further, it might require more skilled labourers. Due to the above reasons, most of the respondents believed that the recommended SSI technologies were complicated in nature of sugar cane cultivation. This is in line with the findings of Renjini (2000) [4], Smitha (2002) [5] and Punitha (2005) [6] who also reported similar findings.

Non-availability of micronutrients at the right time was determined by 42.50 percent of the sugarcane growers. Irregular supply of micronutrients by the Government departments and private input dealers might be the reason for reporting this constraint. This finding support with the findings of Saradha, Rao (2002) [7] and Natarajan (2008) [8].

'Uncertainty of canal water for irrigation' was noted by 41.67 percent of the sugarcane growers. It was found out that most of the respondents of the study area depend on water from Veeranam Ayacut for irrigating their crops. They revealed that they were uncertain about the time of release of water from Veeranam Ayacut. Because of this uncertainty, they were unable to plan the agricultural operations, which in turn would have resulted in unnecessary delay in taking up cultivations. This is in line with the findings of Jeyalakshmi (2008) [9].

### Conclusion

Among the bio-physical constraints, the most important constraint faced by a majority of the respondents was an inundation due to floods (91.66 percent). The overall bio- physical constraints encounter of the sugarcane growers on SSI was ranked as follows, Inundation due to floods (1), Non-availability of quality setts (2), Complexity of new practices (3), Non-availability of micronutrients at the right time (4) and Uncertainty of canal water for irrigation (5) respectively.

**Application of research:** It was observed that the agriculture department officials may take steps to increase awareness and knowledge to rectify on those constraints through distribution of printed literature like leaflets on SSI, regular field visits, frontline demonstrations and trainings. The policy makers and the government bodies also support the farmers by initiating new programmes and giving subsidy by the way of initiating new insurance schemes for eradicating the bio- physical constraints in the adoption SSI technology of sugarcane cultivation.

**Research Category:** Agricultural Extension

**Abbreviations:** SSI: Sustainable sugarcane initiative, R: Rank

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**Study area / Sample Collection:** Cuddalore District of Tamil Nadu, India

**Cultivar / Variety / Breed name:** Sugarcane

**Conflict of Interest:** None declared

**Ethical approval:** This article does not contain any studies with human participants or animals performed by any of the authors.  
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