

## RESEARCH ARTICLE

## PROMOTING SUGAR INDUSTRY TO COPE WITH FUTURE CHALLENGES IN SRI LANKA: A CONSTRAINT ANALYSIS IN SEVANAGALA SUGAR FACTORY AREA

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### Abstract

*Sri Lanka's sugar sector stands in a critical stage and it fulfils only 10% of the local requirement. Sugar accounts for a quarter of the value of all food imports in Sri Lanka. The present study conducted in a sugar factory in Sri Lanka with 40 respondents (both growers and settlers) showed that 20% of the farmers abandoned sugarcane cultivation and shifted to paddy, cowpea, coconut and maize. The major problems as stated by the farmers were absence of proper subsidy scheme, lack of efficient grading system, high transport losses (15%), comparatively lower profit gain (23%), availability of only low sugar variety (Co 775), lack of extension service and irrigation, political problems, etc. Majority of the farmers (87%) perceived the sugar factory as inefficient. Though 57% of farmers cultivate sugarcane under irrigation, there was no drastic yield difference between irrigated and rain fed systems. Twenty percent of the farmers use seed cane as planting material while 80% use ratoon due to low average cost resulting in low yield. The study recommends implementing sugar policy by controlling sugar imports to protect local producer, promoting extension service, introducing high sugar content varieties such as SL 83062 and genetically improved varieties, introducing an efficient subsidy scheme, and grading system to face the challenges ahead.*

**Key words:** *Sri Lanka, sugar industry, growers, settlers, ratoon, seed cane, profit*

### Introduction

Sugar is one of the main food items in Sri Lanka with per capita consumption of 40 kg which is within the high range among the world consumption (Anonymous 2010 a; Bandara, 2000). In Sri Lanka, sugar is mainly produced from different varieties that are complex hybrids of sugarcane, which is generally grown in the dry intermediate zone in the tropical regions of the world. This plant needs high heat flux and about 1000 mm to 1500 mm of water requirement annually. However, water logging reduces its productivity (Gomathi et al. 2010). Tropical climatic temperature is more suitable for cane cultivation and good drainage condition is needed for optimum growth and development (Srivasthawa et al. 1992). The cost of producing sugar from sugarcane is lower than using beet (Bandara, 2000). To cater to the huge demand of sugar, only two sugar factories, namely Pelwatta and Sevanagala are functioning in Sri Lanka at present. The total extent under sugarcane is around 15,000 ha. About 4,000 ha are in Sevanagala, 9,000 ha in Pelwatta and 2,000 ha mainly in Amapara, Badulla and other districts, cultivated by small holders for production of jaggery, sugar syrup, etc. Currently Sri Lanka imports over half a million tonnes of sugar per annum valued at Rs. 12 billion (US\$ 1million) which is projected to increase to nearly one million tonnes by the year 2012 costing approximately Rs 20 billion (US\$ 1.8million) at the current prices (Anonymous 2010 a). Moreover, sugar prices in the world market have increased recently from around US\$ 300/tonne to US\$ 450/tonne due to production of alcohol than sugar to cater

to the increasing demand for alcohol as a fuel additive (Anonymous 2008). Sugar Research Institute (SRI) in Sri Lanka forecasts that the price of sugar will further increase from the present price of around Rs. 60/Kg (US\$ 0.54/kg) (SRI, 2010). Even though the supply should be increased to nurture the growing population, the sugar production in Sri Lanka is stagnating at present. Assuming the population increase to be around 1%, the total annual requirement of sugar by the end of next decade would be around 7 lakh tonnes. If it is planned to produce 350,000 tonnes of sugar annually, i.e. 50% of the local sugar requirement, by the middle of the next decade (year 2015), it would be necessary to cultivate approximately 70,000 ha of sugarcane. According to the present sugar yields, about 5 tonnes of sugar can be produced from 1 ha of sugarcane under rainfed conditions with supplementary irrigation (Anonymous 2010 b). But this is a great challenge ahead as the imported volume is increasing drastically keeping the local production at very low level at present. However, The International Sugar Organization (ISO) predicted a sharp jump in the global sugar surplus to 4.2 million tonnes in 2011/12, up from a surplus of 843,000 tonnes a year earlier. Moreover, the ISO projected global sugar production would increase by 4 percent annually which will reach 172.4 million tonnes in 2011/12. On the other hand, ISO forecasts a 2 percent rise in global sugar consumption to 168.2 million tons in 2011/12 (Brough 2011). Brazil which cultivates sugarcane in 10 million hectares is the world's top sugar producer and exporter. It aims to increase the cultivation to 14 million hectares by 2020. World sugar prices are projected to increase from 11.35 cents/lb in 2005 to 32.7 cents/lb in 2015 (Won and Richard, 2006).

In spite of such global situation, Sri Lankan Government spends huge amount annually for importing sugar and sugar related by products with an increasing trend. Therefore, it is important to promote the local production in order to safeguard the future sugar industry in Sri Lanka. This study is an attempt to suggest a feasible solution to promote the sugar industry by analyzing constraints in Sevanagala sugar industry with the specific objectives to find out the present status of the sugarcane industry, to identify the major problems related to sugar production and to work out the future potential to increase sugar production in Sri Lanka.

## Materials and methods

Sevanagala sugar project area was deliberately selected for the survey due to easy accessibility. This area is located on the left bank of Walawe River adjacent to Udawalawe Reservoir. Forty respondents (growers and settlers) were selected for the field survey by using simple random sampling technique. Informal discussion with officers in Sevanagala sugar factory was also used to collect primary information. Apart from the general questions related to production, the reasons for obtaining low production and yield, cost variation with different factors such as cultivation method, planting material and variety were also examined by using a pre-tested questionnaire. Secondary data were obtained from related sources. Descriptive statistical techniques were used for analysis of the data collected.

## Results and discussion

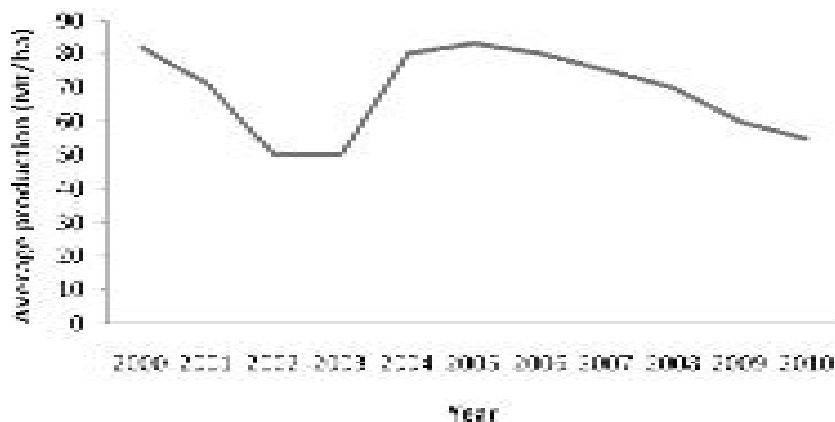
### Status of Sevanagala sugar industry

The factory is situated in a dry zone in Monaragala district in Uva province. The factory is mainly operated for sugar and currently about 1250 tonnes of sugarcane are crushed per day manufacturing approximately 100 tonnes of sugar. Sugar factory covers approximately 7600 ha on the boundary of the Monaragala and Rathnapura. Annual precipitation in the region ranges from 1000 to 1500 mm with two distinct peaks in Yale (March-May) and Maha (September-January). Temperature ranges from 24°C to 32°C and the soil type is reddish brown with sandy clay loam texture (De Alwis and Panabokke, 1972). Sugarcane has been commercially cultivated under both irrigation and rain fed conditions in the area and in the past two decades it has contributed to 25% of the domestic sugar production (SRI, 1995). About 3000 settler farmers cultivate sugarcane in Sevanagala sugarcane cultivation scheme. Two acres of land are provided to them by the factory for sugarcane cultivation and 60 perches for housing. Another 0.5 acres are provided to them by the government for paddy cultivation. Major variety cultivated in the area is Co 775. Other minor varieties include SL 121, SL 8306, SL 925588 (SL denotes Sri Lanka). Sevanagala sugar factory was privatized in 2002 and it is controlled by Daya group of companies at

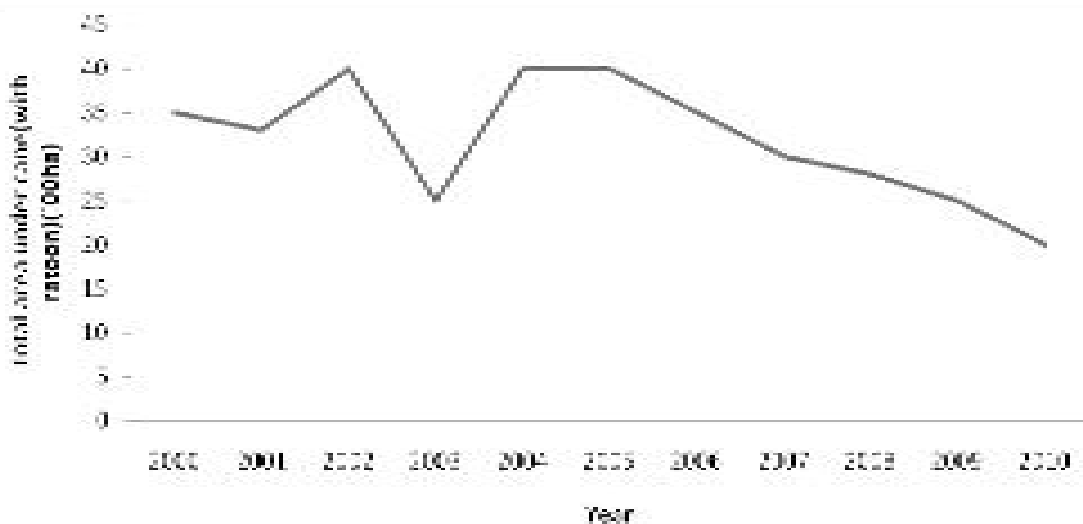
present. The company says its expansion activities have been commenced after privatization in 2002. The factory only produces brown color sugar and the extent of production is 95 tonnes/ha/ farmer/ season.

After 2003, the average yield has increased till 2005 (Fig. 1). According to factory officers' and farmers', the major reason for this higher yield is privatization. Before 2002, it was handled by the Government. But after 2005, there was a gradual decrease in the average yield due to various reasons. Major reasons for this decline are inadequate irrigation and political problems. The total area under cane (Fig. 2) has decreased drastically after 2005 and the cane

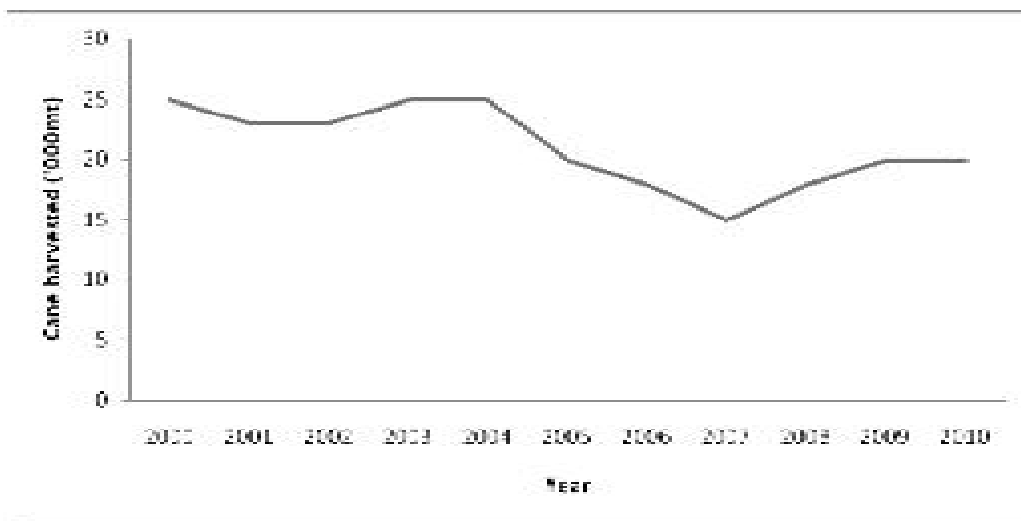
harvested has increased slightly in 2008 (Fig. 3). This is mainly due to the fertilizer subsidy program which was introduced by the factory after 2008. If harvest is higher than 64 tonnes for two acres, farmers received 100% of fertilizer under the subsidy program. If the harvest is higher than 40% of the total harvest, farmers received 50% of fertilizer under the subsidy program. But this is not a considerable and continuous trend. Sugarcane prices in the factory vary with the grade but there is no proper mechanical grading system practiced; only the following visual observation is adopted: Grade A= 2200 Rs/tonne ; Grade B= 2050 Rs/tonne ; Grade C= 1900 Rs/tonne (US\$ 1 = Rs.111.11 in 2010)



**Fig. 1.** Average yield variation in Sevanagala sugar factory in the last decade



**Fig. 2.** Total area under cane (with ratoon) in the last decade



**Fig. 3.** Annual cane production in the last decade

**Reasons for settlers abandoning sugarcane cultivation**

**Profitability of other crops**

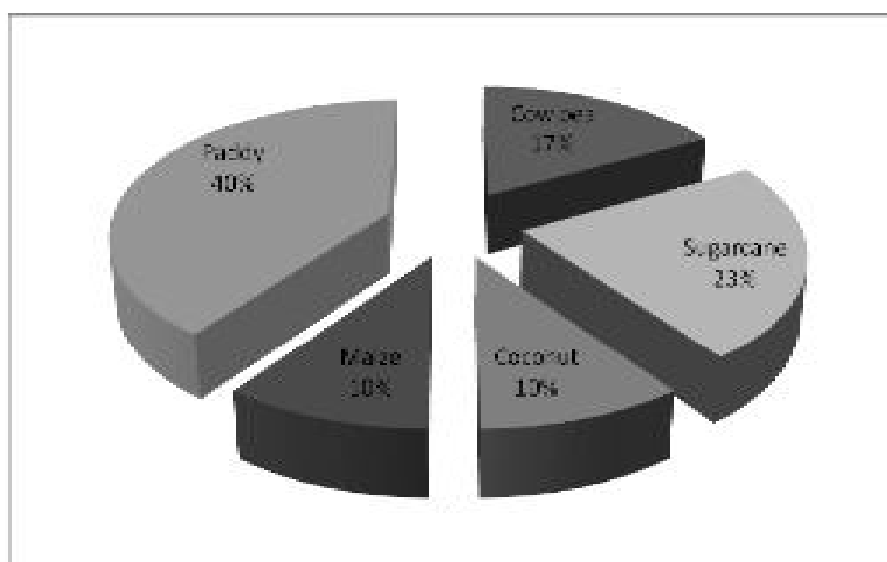
Most of the settlers and out growers were found to leave sugarcane cultivation In Sevanagala sugarcane cultivation area, 20% of the farmers had discontinued sugarcane cultivation at present. Those farmers had mainly diverted to paddy cultivation as paddy gives better profit compared to sugarcane (Fig. 4), and to other crops such as cowpea, coconut and maize due to uncertainty in sugarcane cultivation.

**Lack of proper subsidy prior to 2008**

In previous years there was no proper subsidy program from the government or from the factory. But after 2008, the factory had started the fertilizer subsidy program.

**Weakness of the grading system**

Most of the farmers expressed their dissatisfaction about the present grading system which seems to be unorganized and biased. They do not receive reasonable price for their harvest due to this grading system.



**Fig. 4.** Profit difference between sugarcane and diverted crops

### **Political problems**

After the privatization of the mill, various political problems had occurred in Sevanagala area. Some organized groups discouraged farmers to cultivate sugarcane and encouraged them to cultivate other crops. Their motive was to reduce the profit of the factory as it is fully privatized.

### **Labour requirement**

Sugarcane crop demands high labour requirement and cost from planting to harvesting. This factor had also demotivated farmers from growing sugarcane and made them to divert to other less labor requiring crops.

### **Long crop duration**

If farmers cultivate sugarcane they have to wait for a long time (around 11 months) to obtain harvest compared to other short duration crops cultivated in the study area.

### **Inefficient factory operation**

Majority of farmers (87%) perceived that the factory is inefficient and some improvements are needed to prevent the farmers from diverting to other crops.

### **Factors influencing cost and yield**

#### **Cultivation method and yield variation**

There are two types of cultivation methods, namely irrigated and rain fed. Out of the total farmers surveyed, while 57% cultivated sugarcane under irrigated conditions, the remaining 43% cultivated the crop under rain fed conditions. Average yield under rain fed cultivation was 97.18 tons/ha whereas the average yield under irrigated cultivation was 97.17 tons/ha. There was no drastic yield difference between irrigated and rain fed cultivation methods. Therefore, cultivation method is not the major problem for yield reduction in sugarcane in this area.

#### **Planting method and cost and yield variation**

Both plant and ratoon crops were prevalent during the survey as would be the case everywhere. Only 20% of farmers had plant crop while majority (80%) had ratoon crop. The average yield in ratoon crop was 92.01 tonnes/ha whereas in plant crop it was 101.3 tonnes/ha. Both average yield and the average cost were higher in plant crop than ratoon crop. But

profit was higher in ratoon crop than the plant crop. The major reason for this reduced cost of cultivation in ratoon is that there was no cost of land preparation. But planting material variation was not a major reason for reduction in sugarcane yield.

### **Variety and yield variation**

In Sevanagala area, four sugarcane varieties were used for cultivation. Co 775 is the most popular variety among farmers because it gives higher yield (Fig. 5) with higher dry weight than the other varieties but has less sugar content. Most of the farmers prefer this variety as they receive better price according to the weight of the sugarcane supplied.

### **Constraints in sugarcane cultivation**

The present field survey has identified the following drawbacks related to the sugar industry in Sri Lanka.

#### **Input and cultivation related problems**

##### **Reluctance to grow new varieties**

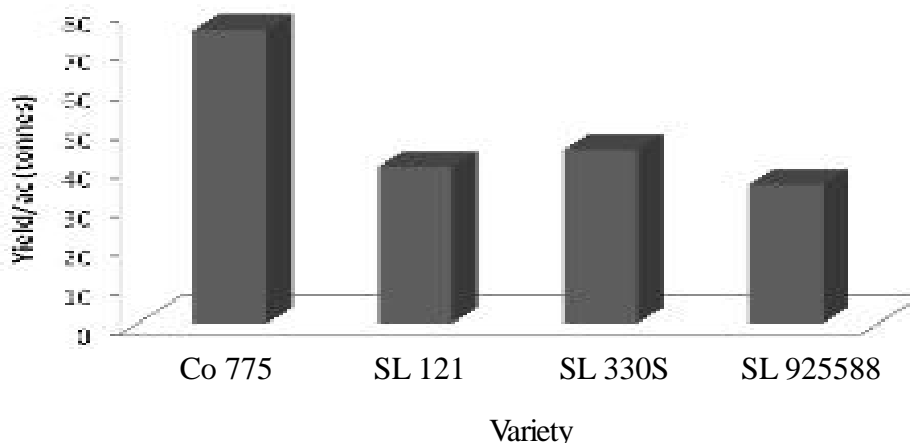
The factory has introduced a variety named SL 8306 which is resistant to sugarcane woolly aphid attack and has high sugar yield. But farmers do not prefer this variety as it is a medium yielder and they are paid according to the weight of the cane supplied. Moreover, the cane yield of SL 8306 is lower than that of Co 775. Therefore, most of the farmers cultivate Co 775 variety.

##### **Scarcity of land**

Nowadays most of the land in Sevanagala area is used to cultivate other crops and diverted for construction work. Therefore, limited area remains for sugarcane cultivation which is not enough to get potential sugar production.

##### **Water problem**

The farmers in this area face serious water scarcity mainly due to improper maintenance of irrigation channels. Even though sufficient numbers of irrigation channels are present in the study area, due to inefficiency of the factory, farmers are not getting equal and fair distribution of water for irrigating their crop. A heavy water demand for paddy crop also adds to water scarcity.



**Fig. 5.** Yield variation with variety

### **Labor scarcity and high labor costs**

The present generation in Sri Lanka does not favour sugarcane cultivation due to the hard work. They divert to the other crops or move to various jobs. Hence, labour scarcity is severe in sugarcane cultivation. Due to the labor scarcity, labor cost is also high in Sevanagala area.

### **Pest and disease attack**

Sugarcane woolly aphid is the major pest in Sevanagala area. Absence of proper control methods results in low yield.

### **Weed problems**

Weed problem is also severe in Sevanagala sugarcane cultivation area. Mana (a grassy weed similar to sugarcane) is a major weed in this area. Weeds compete with sugarcane mainly for water and nutrients.

### **Factory oriented problems**

#### **Heavy transport losses**

Harvested sugarcane is transported to the factory by tractors. The transport loss accounts to as high as 15% of the total harvested cane.

#### **Unpopularity of brown sugar in the international market**

In international market, white colour sugar is more popular than brown colour sugar. But there are no

facilities to produce white colour sugar in Sevanagala sugar factory.

#### **Machinery problems of the factory**

Most of the machines are inefficient and very old in Sevanagala sugar factory. Hence, factory can't achieve their potential sugar production by using these old and malfunctioning machines.

#### **Economic problems**

##### **Very low prices for the sugarcane**

Farmers are paid Rs 2200 (20 US\$) for every tonne of sugarcane while one tonne of sugar costs Rs 94000 (852 US\$)

#### **Conclusion**

Sri Lanka has less sugar production mainly due to the cultivation of low sugar varieties. Therefore, extension efforts are needed to popularize high sugar varieties. The pricing system also should be changed in order to popularize the high sugar varieties to promote the local sugar production. Absence of proper grading system, subsidy/other incentive systems makes farmers to shift from sugarcane cultivation to other profitable crops. There is a high potential to increase production even as the production trend is gradually decreasing in the study area. Moreover, it is feasible to generate power by using sugarcane trash. This needs to be explored since 40 MW of electric power can be produced from 5000 tonnes of crushing capacity. There exists

further potential to produce compost and filter mud which could be used as fertilizers for sugarcane cultivation. The study recommends provision of fertilizer subsidy in order to reduce the cost of cultivation. Production of vinasse, a valuable by product obtained from molasses, and other by products should be encouraged in the study area. Prompt steps should be taken to increase the efficiency of the factory by introducing genetically improved short duration high sugar varieties, modern technology to reduce post harvest losses as well as to produce high quality sugar in order to protect the sugar industry in Sri Lanka. Moreover, Sri Lankan researchers should evolve a more advanced, highly mechanized, economically feasible and efficient sugarcane grading system to promote sugarcane and sugar production in Sri Lanka.

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