

# Nepalese Sugar Cane Juice

Evan Ledwith

AGR\* 2150

November 24, 2015

## Introduction

Sugarcane is one of the most important crops in Nepal as it is grown in many regions of the country and the industry is in fact continuing to grow in size as the total sugarcane farming area and production continue to grow (NARC, 2013). While refined sugar is the main by-product from sugarcane crops in Nepal, sugarcane juice poses an interesting opportunity for Nepali farmers. Sugarcane juice is a popular drink in many countries and an export oriented Nepalese sugarcane juice industry would serve as a value-adding process to the crop.

## Growing Conditions for Sugarcane

The optimal growing conditions of sugarcane include a growing period of at least 9 months with temperatures in the 22 – 38 degree Celsius range, while cooler temperatures are preferred in the ripening and harvesting period so as to enrich sucrose levels in the stem (FAO, 2015). Sugarcane does not require a specific soil type for growth, but soils should be well-aerated and have an available water content of at least 15 percent (FAO, 2015).

These growing conditions are present in the tropical and sub-tropical regions of Nepal, particularly the low-lying Terai plains at the foot of the Himalayas in southern Nepal where the climate is perfectly suited for the optimal growth of the sugarcane crop (Shrestha, Singh & Pant, 2008). While the Terai region dominates sugarcane production, the crop is also widely grown by

hillside farmers in *khet* lands, or levelled terraces (Raut et al., 2011).

### **Labour, Cost and Issues**

Sugarcane is a preferred crop for many Nepali farmers as it is a perennial crop, thus reducing the amount of work and maintenance that farmers must put into preparing the fields every year (Raut et al., 2011). However, sugarcane crops have a high requirement of Nitrogen and Potassium, which necessitates a high degree of fertilizer use, driving up both labour and cost (FAO, 2015). Moreover, there are many diseases and pests that can affect sugarcane farming and cause crop failure. One such disturbance has been the regular outbreaks of Grasshoppers (*Hieroglyphus banian*) disrupting the Nepali sugarcane industry (FAO, 2001). One of the common diseases that affect sugarcane crops in Nepal is that of Grassy Shoot Disease which causes stunted growth in crop stalks, leaf size reduction and white stripes parallel to vascular bundles (Frisson and Putter, 1993).

The majority of the sugarcane crop of Nepal is destined to be sold to Nepali mills to be processed into sugar. However, in 2014, the Sarlahi region's sugarcane production outpaced the mill's abilities to process it, forcing many sugarcane farmers to sell it at a discounted price to sugar mills in India (Koirala, 2014). Another constraint with the sugarcane crop is that it cannot be stored for long periods of time after the harvest as it dries out and quickly loses its value (Koirala, 2014). This poses the threat of farmers losing their crop yield if they cannot find a buyer for the crop quickly enough.

When it comes to the processing of raw sugarcane into juice there are many constraints one must consider. First of all, the production of sugarcane juice on a large scale requires heavy machinery which creates high operating costs and potential environmental problems (Jegatheesan et al., 2012). Acquiring the capital necessary to obtain and operate the essential

equipment could be a large obstacle to a start-up company. Additionally, there is the question of consistency of the product as there are numerous environmental factors that can affect the variability of the sugarcane crop, making it very difficult to ensure a high degree of uniformity of clarity and colour of the juice (Jegatheesan et al., 2012). This could negatively affect the viability of sugarcane juice as a retail product since consistency is essential to the success of a product.

### **Health and Nutritional Benefits**

One of the factors indicating that sugarcane juice could be a successful export product is the fact that it is widely considered to be a nutritional and beneficial beverage. There are many health benefits associated with sugarcane juice as it is a unique source of hydrophilic components with significant biological activities (Singh et al., 2015). One of the health benefits is the fact that sugarcane juice is a diuretic and helps the kidneys fulfill their tasks. Additionally, there is a belief that the juice is beneficial to the human liver and could be a natural means of helping to treat jaundice patients (Singh et al., 2015). Sugarcane juice is also often used to make jagri, a traditional South Asian cane sugar made from boiling sugarcane juice. Jagri is considered to be a healthier alternative to refined sugar as it is high in phenolic acids and flavonoids which can cause antioxidant activity, reduction in cholesterol levels and other health benefits (Singh et al., 2015).

### **Economic Benefits to Nepal**

As discussed earlier, sugarcane cannot be stored for long periods of time after the harvest and Nepali sugar mills are already running at full capacity. Thus, the production of sugarcane juice would ensure that the excess sugarcane crop would not go to waste and would generate further revenue for sugarcane farmers in the Terai region of Nepal. Additionally, producing the sugarcane juice locally for export would serve to add more value to the crop than simply selling

it raw, as processed goods benefit from a higher profit margin. This would not only generate revenue for the sugarcane farmers, but has the possibility of extending employment opportunities in the production of the juice to other members of the community.

### **Practical Information**

In an effort to boost productivity and avoid agronomic constraints, the Sugarcane Research Center in Jeetpur, Nepal has released two landraces of sugarcane (Jeetpur-1 and Jeetpur-2) that offer many benefits for farmers including greater yield potentials, disease and pest resistance and suitability for both autumn and spring planting (Shrestha, Singh & Pant, 2008). While Jeetpur-1 is suitable for irrigated and fertile soils, Jeetpur-2 is a drought tolerant landrace which is better suited for marginal soils, hillside farming and rain-fed conditions (Shrestha, Singh & Pant, 2008). This development poses a great opportunity for Nepali farmers as it ensures that there are landraces suitable for various soil types and environmental conditions, while also allowing farmers in both rain-fed and irrigated systems to have successful crops.

There have also been successes in developing technologies for more effective sugarcane juice filtration and clarification. After the raw sugarcane is crushed into a juice, it must be passed through filtering systems to remove solid materials and other impurities (Jegatheesan et al., 2012). Membrane filters made of organic polymers or inorganic compounds can replace the traditional filtering machinery and offer lower operating costs and higher quality juice (Jegatheesan et al., 2012).

### **Export Potential**

Sugarcane juice is a popular refreshing drink in many countries that produce sugarcane, but has yet to find a large commercial foothold in Canada. However, the juice has many supposed health benefits and is sold in some health food stores. With the boom in health-

conscious people in Canada, there would likely be a large market for sugarcane juice if it was promoted and advertised well enough. Nepali sugarcane juice would be able to tap into this niche market and take control as there are currently no significant distributors of sugarcane juice in Canada.

The most recent Canadian population census in 2011 found that over 1.5 million individuals across Canada identify themselves as South Asian, with the vast majority concentrated in the cities of Toronto and Vancouver (Statistics Canada, 2011). The large South Asian communities in these two cities could serve as niche markets for the sale of sugarcane juice both for use as a beverage and in the creation of traditional jagri. Targeting South Asian food stores for distribution would be a good method of establishing a foothold in the Canadian market.

While it appears that there is a market in Canada for the sale of sugarcane juice, there are issues to consider ensuring that it is an economically sustainable business. Recent legislation was passed in Nepal to promote export oriented industries by affording tax breaks on the purchase of raw materials from both domestic and imported sources for use in the processing of goods for export (TFO Canada, 2015). This will allow Nepali companies to produce their goods at a lower cost, thus giving them a greater profit margin on exports and enhancing their chance of creating a successful export business.

### **Potential Canadian Companies for Importing Sugarcane Juice**

Chalo Freshco. Division of Sobey's focused on the South Asian market in Brampton.

<http://chalofreshco.com/>

Feel Good Natural. Durham Region-based health food store with significant online component.

<http://www.feelgoodnatural.com/>

Goodness Me. Natural food market with locations across southern Ontario.

<http://goodnessme.ca/>

South China Seas. Vancouver based international foods store focusing on the foods of South East Asia.

<http://southchinaseas.ca/>

## **Bibliography**

Crop Water Information: Sugarcane. (n.d.). *Food and Agriculture Organization of the United Nations*. Retrieved from: [http://www.fao.org/nr/water/cropinfo\\_sugarcane.html](http://www.fao.org/nr/water/cropinfo_sugarcane.html)

Economic sectors: Agriculture, forestry and fishing. (2001). *Economist Intelligence Unit: Country Profile: Nepal*.

Food and Agriculture Organization of the United Nations. (2001). *Proceedings of RAP 2001: Report of the Twenty-Second Session of the Asia and Pacific Plant Protection Committee*. Ho Chi Minh City.

Frison, E.A. and Putter, C.A.J. (1993). FAO/IBPGR Technical Guidelines for the Safe Movement of Sugarcane Germplasm. *Food and Agriculture Organization of the United Nations / International Board for Plant Genetic Resources*. Rome.

Jegatheesan, V., Shu, L., Keir, G., Phong, D. (2012). Evaluating membrane technology for clarification of sugarcane juice. *Reviews in Environmental Science and Bio/Technology*. 11(2), 109-124.

Koirala, A. (2014, April 15). Sugarcane farmers hit by lack of buyers. *The Kathmandu Post*.

National Sugarcane Research Program. (2013). *Nepal Agricultural Research Council*. Retrieved from: [http://narc.gov.np/org/sugarcane\\_research\\_program.php](http://narc.gov.np/org/sugarcane_research_program.php)

Raut, N., Sitaula, B., Aune, J., Bajracharya, R. (2011). Evolution and future direction of intensified agriculture in the central mid-hills of Nepal. *International Journal of Agricultural Sustainability*. 9(4), 537-550.

Shrestha, S., Singh, B., Pant, S. (2008). Preliminary assessment of the ethanol producing raw material in Nepal. *Nepal Academy of Science and Technology*. 1 – 32.

Singh, A., Lal, U., Mukhtar, H., Singh, P., Shah, G., Dhawan, R. (2015). Phytochemical profile of sugarcane and its potential health aspects. *Pharmacognosy Reviews*. 9(17), 45.

Statistics Canada. (2011). Immigration and Ethnocultural Diversity in Canada. Retrieved from <http://www12.statcan.gc.ca/nhs-enm/2011/as-sa/99-010-x/99-010-x2011001-eng.cfm>

TFO Canada. (2015). Nepal: Export-oriented industries to get tax refund. Retrieved from <http://www.tfocanada.ca/news.php?item=2836>