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Value Chain Analysis of Sugarcane

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Introduction

Sugarcane (Saccharum officinarum) is a tall, perennial grass that is cultivated for its juice, which is extracted and processed into sugar. It is a popular crop in many parts of the world and is used to produce a wide range of products, including sugar, molasses, ethanol, and biofuels. It is a renewable resource that can be sustainably grown and processed to meet the world's growing demand for sugar and other products. The sugar industry is the second largest agro-based industry in India. The Indian sugar industry generates Rs 80,000 crore and provides employment to 5 lakh people.

Global sugarcane production reached 1.89 billion tonnes in 2021, with world consumption rising to 168.479 million tonnes. India is the second-highest producer of sugarcane in the world, with Uttar Pradesh producing over 177 million tonnes.

Sugarcane Value Chain

The sugarcane value chain involves a range of activities, including planting, harvesting, transportation, milling, refining, packaging, and distribution. The sugarcane value chain at the production level involves a series of activities from land preparation to harvesting and transportation. These activities include land preparation, planting, fertilization, irrigation, weed control, and pest and disease control. Fertilizers, irrigation, weed control, and pest and disease control are essential for the success of the sugarcane crop. Sugarcane is harvested when it is mature and has accumulated enough sugar. It is transported to the sugar mill for processing.

Sugarcane is harvested, cleaned, crushed, clarified, evaporated, crystallized, separated from molasses, refined, and packaged for consumption. Harvesting, cleaning, crushing, clarification, evaporation, crystallization, separation, refining, and packaging are all part of the process.

The packaging stage is an essential part of the value chain, as it ensures that the final product is protected and presented in a way that meets the needs of consumers and other end-

users. The sugarcane value chain is a complex system that involves multiple stages, including cultivation, processing, and packaging. One emerging trend is the use of eco-friendly packaging materials made from sugarcane bagasse, a by-product of the sugarcane milling process. Sugarcane bagasse has several advantages over traditional packaging materials, such as being biodegradable and compostable, lightweight and durable, and suitable for a wide range of products. This is one way to promote sustainability and reduce the environmental impact of the sugarcane value chain.

The distribution stage of the sugarcane value chain is essential for ensuring that the final products reach their intended destinations in a timely and efficient manner. It involves transportation, storage, and logistics. Transportation is an essential component of the distribution stage, while storage is another critical aspect. Logistics involves managing the movement and storage of the products, coordinating with suppliers, and ensuring timely delivery to customers. This stage is essential for maintaining product quality and reducing waste.

Processed Products of Sugarcane

Sugar is the most common product made from sugarcane and is used as a sweetener in a wide variety of food and beverage products. Molasses, a by-product of sugar production, is used as a flavouring agent in food products and as a source of nutrients for livestock feed. Ethanol, another by-product of sugarcane processing, is used as a fuel for vehicles and as an ingredient in the production of hand sanitizers and other products. Sugarcane juice is consumed as a refreshing drink in many countries, often mixed with lime, ginger, or other flavourings. Jaggery, a traditional sweetener made from sugarcane juice, is popular in South Asia and other parts of the world. Sugarcane fiber, known as bagasse, is used as a fuel for the processing plant or as a raw material for the production of paper, board, and other products. Sugarcane is also used as a raw material for the production of biofuels, which can be used as a renewable energy source.

Sugarcane juice is a detox drink that contains 180 calories, 30 grammes of sugar, and a significant amount of nutritional fibre. Sugar is the most common product made from sugarcane and is used as a sweetener in food and beverage products. Molasses, ethanol, sugarcane juice, jaggery, bagasse, and biofuels are also produced from sugarcane. Sugar is extracted by crushing the stalks and boiling them to form molasses, which is then further

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processed to separate the sugar crystals from the syrup. The sugar industry in India is the second largest agro based industry after textiles, with 6 million agricultural farm families and 0.5 million skilled and semi-skilled industrial workers. India's share in global sugar production has improved from 5% to 16% over the last 50 years, with sugar produced in 111 countries and 20 additional countries growing sugarcane or sugar beets for export. Only 10 sources produce 70% of global sugar production.

Bagasse is a cellulosic waste product that can be used as a raw material for making paper, cardboard, and other products. It can also be used as a biofertilizer and a biopesticide. Bagasse is a powerful fertiliser that promotes soil fertility and increases crop productivity. It is used as a primary fuel source in sugar mills, as a raw material for board production, biogas production, and furfural production. Furfural is an organic compound derived from agro-industrial wastes and residues containing pentosans, and can be used for animal feed and ethanol production.

Molasses is a viscous syrup made from sugar cane and is used to sweeten things. It can also be used as cattle feed, fermented fermentation processes, rum, ethyl alcohol, beer, wine, industrial alcohol, dye, medicine, soap solvent, and other chemical processes. Jaggery is a fermented alcoholic beverage with a sugar concentration of 14-18%. Jaggery is a traditional sweetener obtained from sugarcane and is rich in vitamins and minerals. It can act as a vehicle to fight iron and vitamin deficiency and has anti-toxic and anti-carcinogenic properties. India is the largest producer of jaggery under an unorganized agro-processing sector, with 55% of the total world production being produced in India.

Sugarcane juice is purified by carbonation or sulphitation, resulting in press mud, which contains sugar, calcium sulphite, calcium phosphate, nitrogen, phosphate, potassium, organic matter, and lime. Press mud can be used as fertilizer, animal feed, construction lime, metal polishing powder, board chalk, tooth powder, and wax. Cane tops, leaves, and trash are also useful for thatching huts, camp fire fuel, compost, and producing cardboard or wrapping paper.

SWOT Analysis of Sugarcane Value Chain

Sugarcane is a versatile crop that can be used to produce a variety of products, including sugar, molasses, ethanol, and biofuels. It is a renewable resource that can be sustainably grown and processed, making it an environmentally friendly crop. It is a major source of employment for many people, and has a well-established supply chain and distribution network. However,

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its production and processing can be highly energy-intensive, leading to high operating costs. Opportunities include growing demand for sugarcane-based products, advances in technology, and the focus on sustainable agriculture and supply chains. Threats include competition from other sweeteners, changes in government policies, environmental concerns, and climate change. Successful management of these factors will be critical for the industry's long-term sustainability and competitiveness.

Government Initiatives

The main challenges of sugarcane farming in India are low productivity, transportation, and price fluctuations. To address these issues, the central government has implemented a fair and remunerative price (FRP) and introduced the concept of Minimum Selling Price (MSP). Financial assistance has been extended to sugar mills to facilitate export, maintain buffer stocks, and augment ethanol production capacity. Diversion of surplus sugar for production of ethanol has led to improved financial conditions. The sugar sector has become self-sustainable due to exports and diversion to ethanol.

The government of India has reviewed the sugar subsidy scheme and has decided to continue it for restricted coverage of AAY families, providing 1 kg of sugar per family per month. The ethanol blended petrol programme (EBP) has been scaled up to 10%, simplified the procurement process, and waived excise duty on ethanol supplies to OMCs.

Conclusion

The value chain for sugarcane in India is intricate and includes a number of players. Despite the industry's considerable potential, there are a number of issues that need to be resolved. To overcome these obstacles and realise the potential of the sector, the government, industry participants, and other stakeholders must collaborate. The sugarcane sector in India has the potential to considerably boost the economy of the nation and create millions of jobs with the appropriate regulations and procedures.

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