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SSI State of Sustainability Initiatives
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Global Market Report: Sugar

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Sugarcane demand will grow for food and fuel production, driven by increased sugar consumption in Asia and Africa.

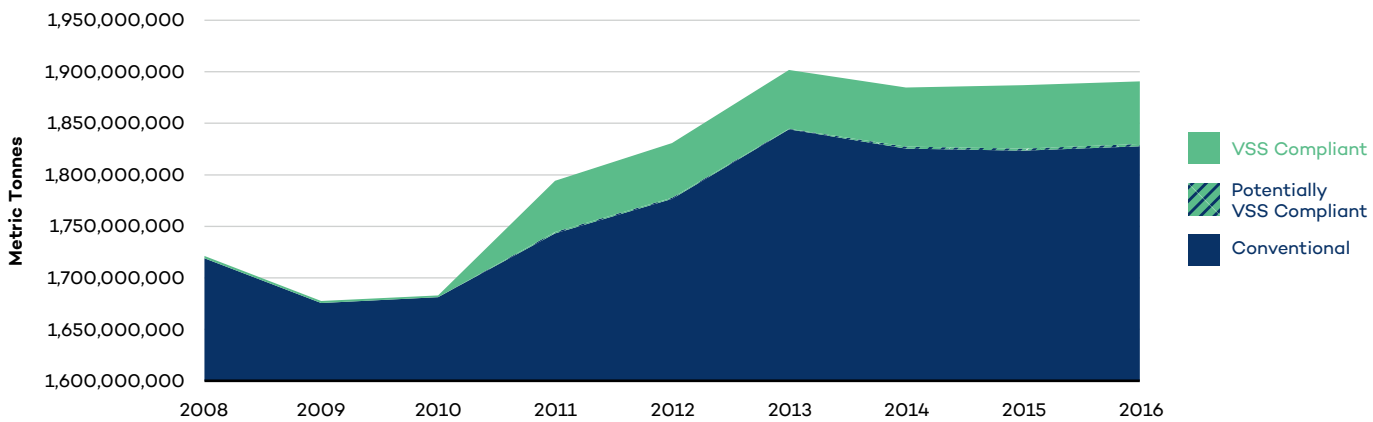
Sugarcane is a crop primarily grown in tropical countries and has the notable quality of serving as both a food and a fuel source. Along with supplying 86 per cent of the world's sugar (the remaining coming from beet), sugarcane also serves as a key biofuel feedstock, given that it is highly efficient in converting sunlight into energy.[1,10] Seventy-five per cent of the sugarcane produced globally is consumed by the food manufacturing sector; the balance is used in biofuel production.[2,23]

Sugarcane cultivation and processing currently provide livelihoods for 100 million people across the world.[3] Looking at the country level, the sugarcane industry employs over 1 million people in Brazil, nearly 25 per cent of its rural workforce. The Thai sugarcane supply chain employs 1.5 million people, including 107,000 smallholders, and around 0.5 million people depend on the sugarcane industry for their livelihoods in South Africa.[4–6,53]

Cane sugar, the raw sugar obtained from processing sugarcane, had an export value of USD 24.7 billion in 2017; an estimated 34.43 per cent (at least 54,593 million tonnes) of total cane sugar produced that year was exported.[7,10] The largest cane sugar exporting countries in 2017 were Brazil (USD 11.4 billion), Thailand (USD 2.6 billion) and France (USD 1.3 billion); the largest cane sugar importing countries

VSS-compliant sugarcane accounted for at least 3.2 per cent of total sugarcane production in 2016.

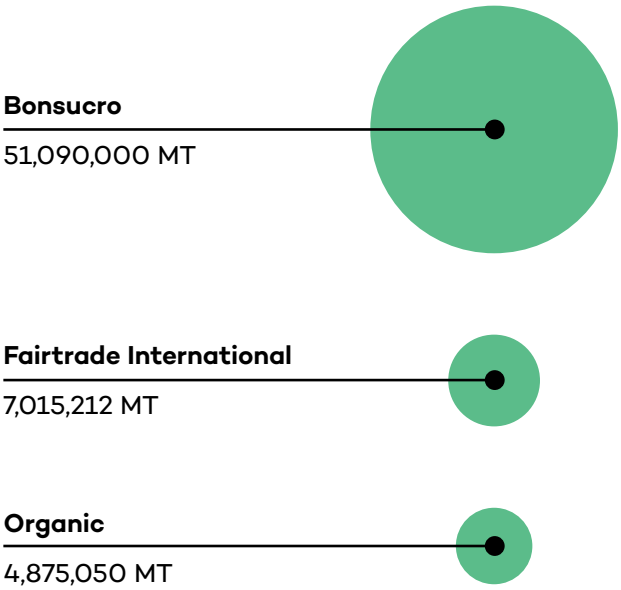
Figure 1. Global sugar production trend 2008–2016[16,39]



Note: VSS-compliant production volumes refer to sugarcane produced in compliance with one or more VSSs. Conventional production volumes do not comply with or are not recognized by an existing VSS. Production volumes that are defined as potentially VSS-compliant cannot be definitively listed in either category with the data currently available.

How much sugarcane is certified by each standard?

Figure 2. VSS-compliant sugarcane production volumes in 2016[16]



were Indonesia (USD 2.3 billion), the United States (USD 1.7 billion) and Bangladesh (USD 1.1 billion).[8,9]

Cane sugar supply growth outpaced demand growth for human consumption from 2016 to 2017, at rates of 8 per cent versus an estimated 2 per cent respectively. This imbalance resulted in a global cane sugar surplus of around 11 million tonnes.[10] Assuming favourable weather conditions, this cane sugar surplus is expected to persist, according to projections through the year 2025, due to the expansion of planted areas in Asia, specifically China and Indonesia, as well as improved farm productivity.[10,11]

Developing countries account for approximately three-quarters of global sugar consumption. They are expected to lead the future demand growth of the sector with increasing consumption of caloric sweeteners, processed products, sugar-rich confectionery and soft drinks.[10,14] For example, in 2018, sugar (white or refined) met almost 80 per cent of the sweetener market demands, which had a retail value of USD 57.5 billion.[12] Asia leads in terms of demand growth, followed by Africa,[13] mainly due to population growth and urbanization, rising incomes and shifting dietary patterns.[13] In contrast, demand is expected to stagnate in developed countries due to slowing population growth; dietary changes; health concerns related to sugar consumption, such as obesity and diabetes; and government interventions to reduce sugar intake.[14,15]

Another notable market development in the sector is the recent expansion—though still very modest—of voluntary sustainability standards (VSSs) among sugarcane farms and mills.[A] VSSs were almost non-existent about a decade ago: in 2016, for example, 3.2 per cent of the market was made up of VSS-compliant sugarcane, 0.1 per cent of sugarcane that was potentially VSS-compliant and 96.7 per cent of conventional sugarcane production.[16]

The growing health concerns related to sugar consumption have led to increased government regulation, reduced corporate procurement and adjusted consumer preferences for less sugar intake. These developments have, in turn, slowed down sector market growth projections.[15,17,18] As a result, the Organisation for Economic Co-operation and Development (OECD) and the Food and Agriculture Organization of the United Nations (FAO) predict that sugarcane production will grow at a measured pace of 1.1 per cent annually from 2018 to 2027, compared to 2.1 per cent annually over the last decade.[13] In parallel, sugar consumption will grow at a rate of 1.60 per cent per annum and is expected to reach a retail market value of USD 63.7 billion in 2024.[12,13]

Despite this moderate growth forecast, the sugarcane sector faces important challenges that affect both its overall economic prospects and its sustainability. World sugar prices (raw and white sugar) have historically been highly volatile, and often the price of raw sugar falls below production costs, making sugarcane farmers vulnerable to falling into debt and losing their land and assets.[19] Government interventions, specifically subsidies and import tariffs, influence sugar prices greatly. They are also affected by oil price movements, which, in turn, have an impact on ethanol prices and, thus, sugar prices. Other factors include shifting weather patterns, production methods that have moved toward

[A] The United Nations Forum on Sustainability Standards (UNFSSs) defines VSSs as "standards specifying requirements that producers, traders, manufacturers, retailers or service providers may be asked to meet, relating to a wide range of sustainability metrics, including respect for basic human rights, worker health and safety, the environmental impacts of production, community relations, land use planning and others." To review the purpose of various VSSs and the set of requirements producers need to comply with under each scheme, please access State of Sustainability Initiatives Reviews in the following link: https://www.iisd.org/ssi/

mechanization, and export fluctuations from Brazil and India due to their large domestic demands.[10,19,20]

Along with price volatility and low farm prices, the sector faces other important challenges. Incidences of significant land acquisition, or land grabbing, have been documented in the Brazilian states of Mato Grosso do Sul and Pernambuco, as well as in Sierra Leone, Indonesia, Kenya, Zambia, Mali and Cambodia.[20,21] Furthermore, the industry has a poor labour rights record and documented occurrences of forced and child labour; in addition, occupational health and safety issues at plantations and mills are not uncommon, even in some of the largest producing countries, such as Brazil, India and Thailand.[21,23]

Sugarcane cultivation can also have harmful environmental impacts, such as air pollution and greenhouse gas (GHG) emissions that result from sugarcane field burning before manual harvesting. It can also contribute to water stress due to overconsumption and agricultural runoff. Approximately 30 per cent of sugarcane production takes place in high or extremely high water stress areas, and agricultural runoff coupled with the overapplication of fertilizers and pesticides have polluted water bodies.[21,23] Left unchecked, all of these sustainability challenges could eventually affect continued supply and demand.

VSS-compliant sugarcane production is rapidly expanding.

Since at least the 1990s, non-governmental organizations, private sector actors and other sugarcane industry stakeholders have used VSSs to provide consumers with a product that they can identify as having been produced through sustainability-conscious methods that address the challenges listed above. For example, sugarcane production that meets these standards needs to limit air pollution and GHG emissions, while also conserving water resources. Compliance also means respecting labour rights and worker health and safety, not engaging in land grabbing and taking steps to improve producer profitability.

The sustainability impacts and reputational risks associated with the sugarcane industry have been a significant motivation for civil society and private sector stakeholders to support the establishment and propagation of VSS in the sector. By providing sugarcane-based product consumers with some assurances that their choices can support more sustainable sugarcane farming practices, VSSs are creating a virtuous cycle of increasing investment in sugarcane farming operations that addresses many of the sector's socio-environmental challenges.

VSSs only recently started capturing a share of sugarcane production in 2013 with the establishment a few years earlier of Bonsucro, a single-sector initiative focused on enabling more sustainable sugarcane production. There have been promising signs on the supply side in recent years: VSS-compliant sugarcane experienced a compound annual growth rate (CAGR) of about 52 per cent from 2008 to 2016, reaching at least 3.2 per cent of sugarcane overall production in 2016. Bonsucro, Fairtrade, Organic and Rainforest Alliance are the main VSSs in the sugarcane sector when ranked by production size.

In 2016, at least 60 million tonnes of sugarcane was VSS-compliant, valued at USD 1.5 billion. This value is derived from the average producer prices per country, as reported by the FAO, which is then applied to the volume of VSS-compliant sugarcane produced per country.[16,24] The majority of VSS-compliant production,

LIVELIHOODS

100 million people make their living from sugarcane cultivation and processing

25% of the rural workforce in Brazil

1.5 million people in Thailand

0.5 million in South Africa

MARKET VALUE

Over USD 1.5 billion worth of VSS-compliant sugarcane based on 2016 sugarcane producer prices

CAGR 2008–2016

Conventional production is up by 0.77% while VSS-compliant production is up by 51.53%

SUGARCANE PRODUCTION IN LHDCs

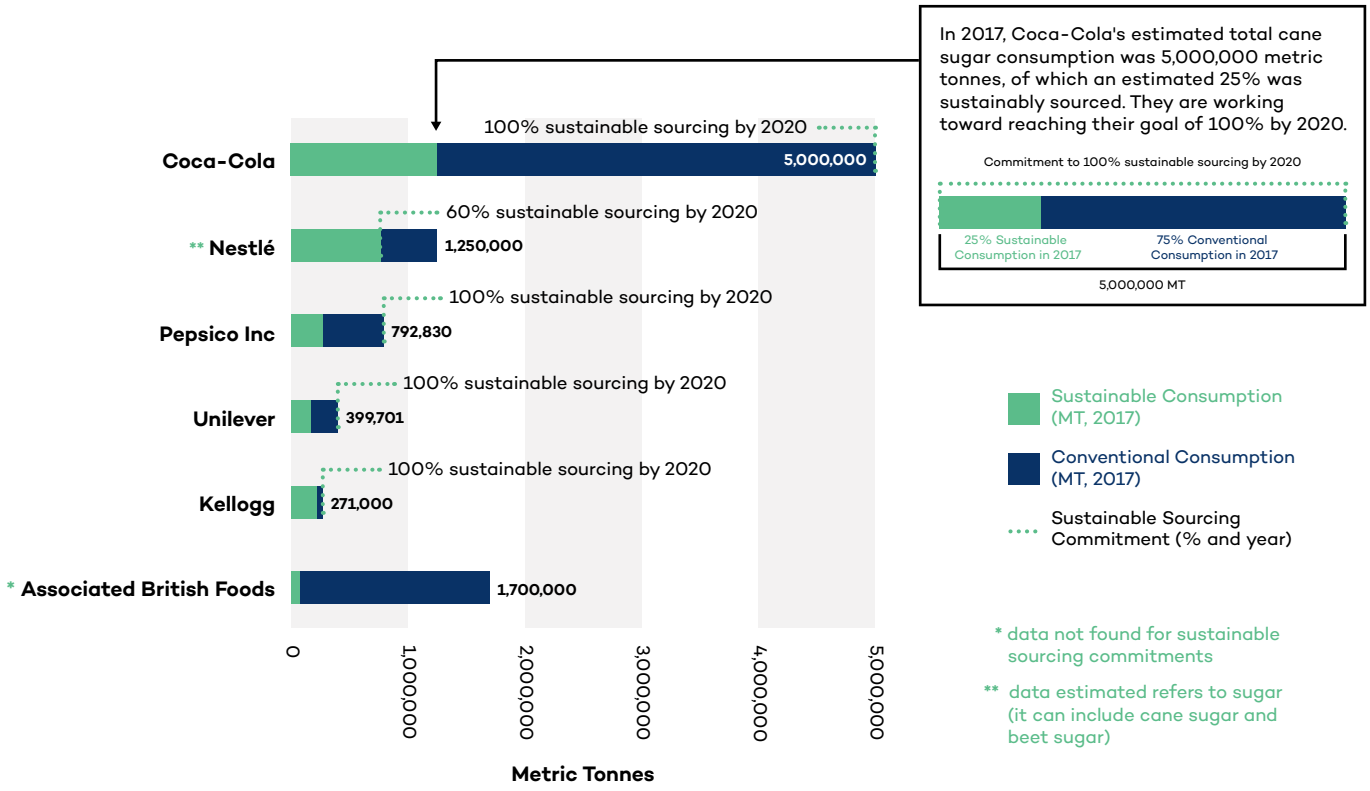
2% of total sugarcane produced

2% of VSS-compliant sugarcane produced

based on 2016 data

Good progress toward sourcing more sustainable cane sugar.[29–39,55,56]

Figure 3. Major cane sugar-consuming companies and their sustainable sourcing commitments*



Source: See details of the estimates at the end of this document.

at approximately 90 per cent, comes from Latin America, specifically Brazil, Paraguay, Costa Rica and Argentina. Some substantial volumes also come from Australia, India and Malawi.[16,25]

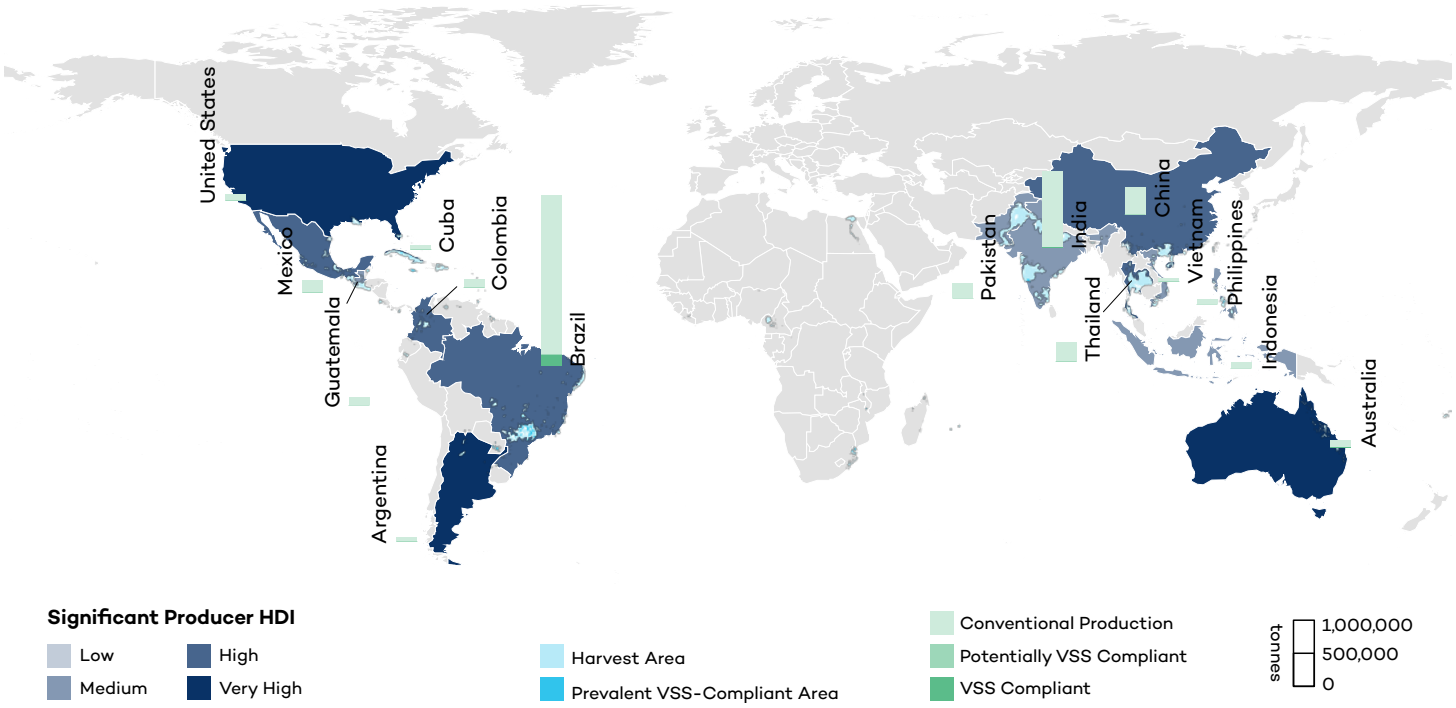
Corporate sustainable sourcing commitments are driving demand for VSS-compliant sugar. The six largest cane sugar-consuming companies in the food manufacturing sector purchased more than 9.4 million tonnes in 2017. From this total, at least 2.7 million tonnes was VSS-compliant. Based on their sourcing commitments and assessing these against current cane sugar sourcing information, an additional 4.5 million tonnes of sustainable cane sugar could be consumed by 2020. These buyer sourcing patterns respond to end-consumer preferences to purchase more sustainably sourced sugar in certain markets. For instance, evidence suggests that the consumption of organic and Fairtrade sugar is increasing in Europe.[26] In addition, global demand for organic sugar has increased in the last few years and is expected to grow at a CAGR of 15.55 per cent by 2022, fuelled by increased use of organic sugar in food manufacturing, such as chocolate, confectionery and bakery products.[27,28,54]

Despite projected growth in demand for VSS-compliant sugarcane, VSS-compliant sales have not kept up with production.[25] Demand for sustainably produced sugar is still new and overall has not been matched by consumer willingness to pay higher prices.[3] In addition, most consumers do not know where the sugar used in company products comes from, since there is a lack of product traceability through the value chain that makes sugar the least observed agricultural commodity.[40] This is partly influenced by negative health perceptions associated with sugar, which disincentivize companies to market VSS-compliant sugar content in their products.

This supply–demand imbalance can pose significant limitations on VSS-compliant sugarcane's market

Sugarcane-Growing Regions of the World

Figure 4. Distribution of sugarcane production in the top 15 producing countries in 2016



Note: Twelve of the 15 countries registered volumes for VSS-compliant production in 2016, with the exception of Indonesia, Thailand and the United States, but these volumes are low in comparison to reported total production.[16,39,51,52]

Download high resolution version of the map at https://www.iisd.org/sites/default/files/publications/ssi-global-market-map-sugar.pdf

growth potential. A strategy that could help address this imbalance is to incentivize greater demand for VSS-compliant sugarcane within the largest producing countries, namely Brazil, India and China, and increase its market share in large sugar-consuming markets in developing countries. This strategy could be possible through educational campaigns, price incentives and targeted procurement programs.

VSS-compliant production could result in beneficial, sustainable development outcomes for sugarcane-growing countries.

VSS-compliant sugarcane production is expected to grow in the near future, driven by potential demand for more sustainable food and fuel products as these become more mainstream.[41,42] Nevertheless, overcoming important challenges and risks such as sugar price volatility, land grabbing, environmental pollution and the current supply–demand imbalance is imperative for VSS-compliant sugarcane to continue growing. VSS will also have to continue evolving with changing production methods, which will bring new sustainability challenges. For instance, the evolution of sugarcane as a biofuel feedstock may require more stringent provisions to prevent indirect land-use change and unintended natural land conversion to support sugarcane production.[43]

Sustainable sugarcane production is experiencing greater growth than the overall sector and is on the verge of significant expansion. Established in 2008, Bonsucro has become the largest VSS in the sugarcane sector by production volume with certified mills in 13 countries.[44,45] Its growth began to take off in 2011 and was initially focused on Brazil and Australia.[44,45] Rainforest Alliance expanded into sugarcane in 2012 but has been dormant in the sector in recent years. This may change with time as it gets a better foothold

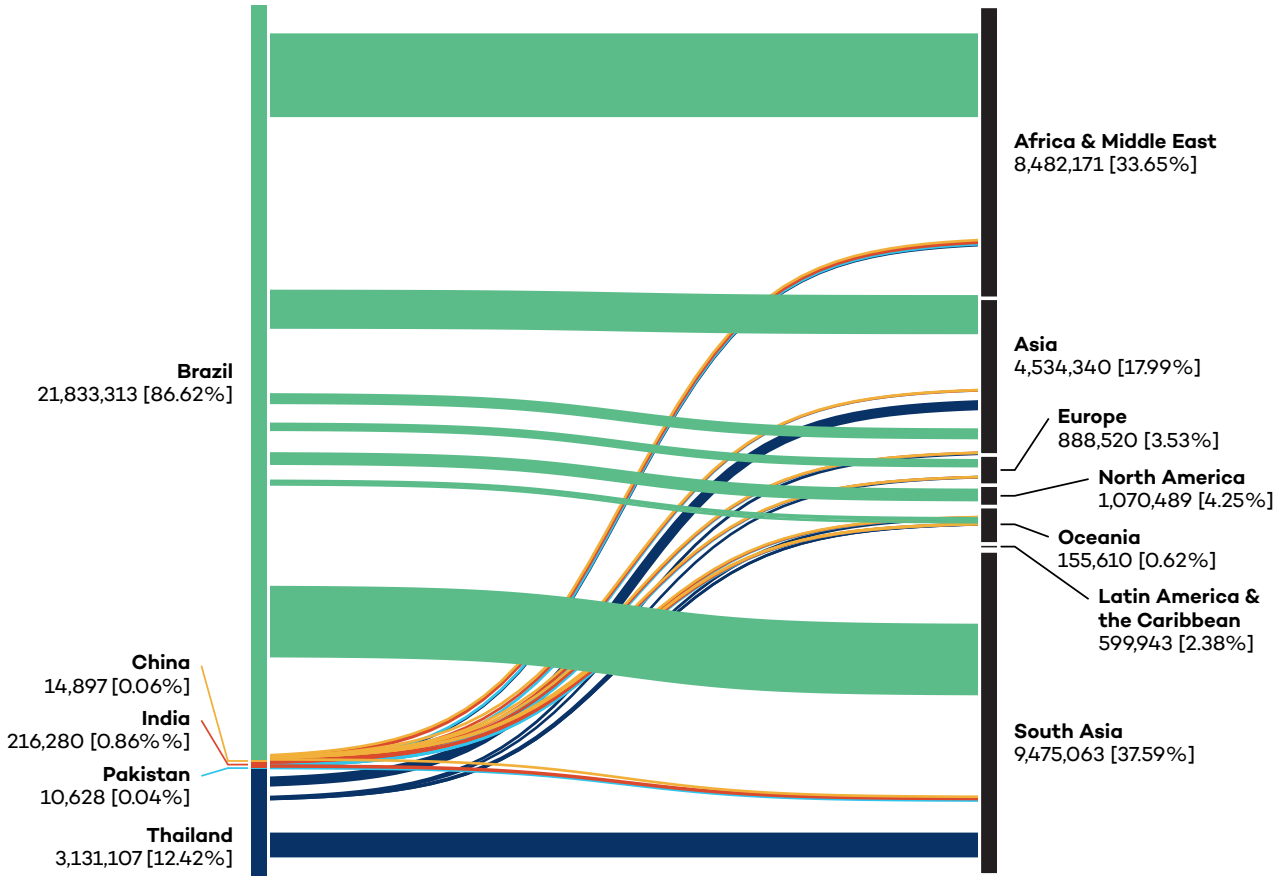
in the sugarcane sector and completes its merger with UTZ Certified.[25] The Proterra Foundation is collaborating with VIVE, a sustainable supply program, to expand into certifying sugarcane.[46,47] This expansion of VSS-compliant sugarcane production might open opportunities for producing countries to move to more sustainable forms of production.

Another important consideration in assessing opportunities for expanding VSS compliance in the sector is the human development level of sugarcane-producing countries, as assessed by the Human Development Index (HDI). Out of 104 sugarcane-growing countries in 2016, 30 were low human development countries (LHDCs) and only three produced VSS-compliant sugarcane. LHDCs produced 2 per cent of total sugarcane and 2 per cent of total VSS-compliant sugarcane in 2016. Fairtrade currently has the largest volume of sugarcane production coming from LHDCs, followed closely by organic.

Due to its currently limited presence in sugarcane-producing LHDCs, the expansion of VSS-compliant sugarcane production in these countries could result in important environmental and societal development benefits via the adoption of more sustainable agricultural practices. Among these benefits could be lower GHG emissions from harvesting, increased water conservation and better enforcement of labour and human rights.[19,48]

Brazil dominates the South–South trade of cane sugar.

Figure 5. Trade flows of the largest sugarcane-producing countries in 2016 (tonnes)[39,50]



Note: These five countries represent 74 percent of total sugarcane production in 2016. The percentage in brackets for each country represents the proportion of the total volume of cane sugar exported in 2016 by these countries. The percentage in brackets for each region represents the proportion of the total volume of cane sugar imported in 2016, from the five countries.

Expanding VSS-compliant sugarcane production is perhaps most viable among countries that are already producing significant shares of the world's sugarcane and have begun to adopt VSSs. Of the top sugarcane-growing countries, Brazil, India, China, Thailand and Pakistan offer good prospects for increasing VSS-compliant sugar production, considering their total sugarcane output and existing presence of VSSs. These countries all fall within the categories of high or medium human development under the HDI.

The total contribution of LHDCs to the global production of sugarcane is very small. In terms of the prospects for expanding VSS-compliant sugarcane production in LHDCs and maximizing sustainable development outcomes, the LHDCs showing the most potential for growth in light of their share of total sugarcane production, the presence of VSSs and their HDI value are Sudan and Uganda, followed by Zimbabwe, Madagascar and Malawi, according to our analysis based on 2016 figures.[16] VSS-compliant sugarcane production has yet to take place in Sudan, Uganda, Zimbabwe and Malawi. If properly implemented, VSS can potentially be an important development catalyst within sugarcane-producing LHDCs, as they could provide a supply chain governance structure and monitoring system via standard assurance requirements. Of course, formidable challenges such as farming capacity building and access to suitable transportation networks will need to be overcome with the assistance of multiple stakeholders including VSS. Positive development outcomes through the expansion of VSSs can also take place in the largest sugarcane-producing countries, such as Brazil, India and China, where smallholder sugarcane farmers continue to experience poverty.

Consumer demands for more sustainable food and energy are expected to increase, and governments are implementing more demanding policies and regulations in order to foster sustainable production and consumption. VSS will therefore continue gaining importance in the sugarcane sector. For instance, the European Union Renewable Energy Directive is one example that has required VSSs to align themselves with regulations on what serves as an acceptable biofuel feedstock, thus allowing standard-compliant crops to continue having access to potential European markets.[43] Incentivizing consumers to purchase more VSS-compliant sugarcane in the largest producing countries is an important opportunity, particularly if prices become more competitive with conventional sugarcane. Although expanding VSS-compliant sugarcane production in LHDCs could yield development benefits, their contribution to global sugarcane production is relatively small compared to the largest producers, which could limit the potential for both increasing production and the uptake of these standards. Nevertheless, LHDCs remain a potential growth and development impact opportunity for VSSs to consider.

The sustainability challenges facing the sugarcane sector are complicated and difficult to address, requiring coordinated efforts involving all supply chain stakeholders. Efforts within VSS are ongoing to connect their supply chain stakeholders and develop sustainable solutions to the sector's challenges. The Bonsucro Connect Platform is one initiative aiming to provide strategic information to its members to improve their competitiveness and sustainability.[49] By enabling sugarcane supply chain stakeholders to come together to move the sector toward sustainability, VSSs are expected to continue to play an important role in addressing its persistent sustainability issues.

FIGURE 3 ESTIMATIONS MADE FOR CALCULATING SOURCING VOLUMES FOR THE FOLLOWING COMPANIES:

Coca-Cola

- **Purchase Volume Total 2017 *(5,000,000 Mt):*** This figure was estimated by taking the standard-compliant volume of cane sugar reported by the company in 2016 (1,000,000 Mt), which represented 20 per cent of total sugar sourced, and then calculating the 100 per cent. This volume was used as a proxy for 2017.[30]
- **Purchase Volume Standard-Compliant Certified 2017 *(1,250,000 Mt):*** This figure was obtained by taking the 25 per cent of VSS-compliant cane sugar purchased, as reported by the company in 2017, from the total sourcing volume estimated for the same year.[29]

Nestléc

- **Use Volume Total 2018 *(1,250,000 Mt):*** This figure was obtained by taking the 10,000 tonnes achieved through the sugar reduction goal by the company, which represents 0.8 per cent of total sugar used in 2018, then calculating the 100 per cent of sugar used by the company. This volume was used as a proxy for 2017.[31]
- **Use Volume Standard-Compliant Certified 2018 *(762,000 Mt):*** This figure was obtained by taking the 61 per cent of VSS-compliant sugar reported by the company, from the total sugar used in 2018. This volume was used as a proxy for 2017.[32]

Pepsicoane

- **Purchase Volume Total 2017 *(792,830 Mt):*** This figure was obtained by multiplying the company's cane sugar market share (0.5 per cent of world's sugarcane production in 2017, understanding that this refers to cane sugar)[35] by the global cane sugar produced in 2017 (158,566,000 Mt), as reported by FAO stat. *(Own calculations based on data from the OECD–FAO 2019 agricultural outlook for total raw sugar production in 2016 and 2017, with 86 per cent of total raw sugar production from sugarcane and sugar beet making up the remainder.)*[10]
- **Purchase Volume Standard-Compliant Certified 2017 *(269,562 Mt):*** This figure was obtained by taking the 34 per cent of VSS-compliant cane sugar reported by the company from the total purchased volume estimated for 2017.[34]

Kellogg

- **Purchase Volume Total 2017 *(271,000 Mt):*** The brand reported a total of 271,000 Mt of cane sugar sourced in 2017.[22]
- **Purchase Volume Standard-Compliant Certified 2017 *(216,800 Mt):*** This figure was obtained by taking the 80 per cent of VSS-compliant-sourced cane sugar reported by the company in the *Status of Kellogg Sugar Cane Supply Base* from the total purchased volume reported in 2017.[22] Note that approximately 40 per cent is fully third-party certified and about 40 per cent is uncertified by a third party, but uses verified on-site practices applying different programs.

Unilever

- **Purchase Volume Total 2018 *(399,700 Mt):*** This figure was obtained by multiplying the company's cane sugar market share (0.26 per cent of world's cane sugar market in 2013, taking it as a proxy for 2018)[37] by the global cane sugar produced in 2018 (153,731,000 Mt), as reported by FAO[10] *(OECD–FAO reports total raw sugar volume of 178,757,000 tonnes. From that total, 86 per cent [153,731,000 tonnes] is cane sugar).* This figure was used as a proxy for 2017.
- **Purchase Volume Standard-Compliant Certified 2018 *(167,874 Mt):*** This figure was estimated by taking the 42 per cent of VSS-compliant sourced sugar (including self-assessed and physical certified and excluding Bonsucro credits) reported by the company,[36] from the total produced volume in 2018. This volume was used as a proxy for 2017.

Associated British Foods (ABF):

- **Produce Volume Total 2017 *(1,700,000 Mt):*** This figure was obtained by considering the annual volume production from the only facility producing or processing sugarcane for ABF in 2017, which is Illovo Sugar Africa.[55]
- **Produce Volume Standard-Compliant Certified 2017 *(72,800 Mt):*** This figure was obtained by converting the total VSS-compliant production of sugarcane processed by Illovo Sugar Africa in 2017 (260,000 Mt)[38] into cane sugar. The ratio used for the conversion was 0.28 Mt cane sugar/1 Mt sugarcane (260,000 X 0.28).

  This ratio was calculated based on the fact that 6,265,000 Mt of sugarcane produced 1,760,000 Mt of cane sugar, as reported by Illovo Sugar Africa in 2015.[56] We took this ratio as a proxy to estimate 2017 volumes of cane sugar.

  Note: This data point only considers volumes of VSS-compliant production for Illovo Sugar Africa.

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The Sustainable Commodities Marketplace Series provides a market performance overview and outlook for key agricultural commodities that comply with a number of voluntary sustainability standards (VSSs), focusing on global sustainable consumption and production. Each year, the series focuses on a different overarching theme, with individual reports for that year devoted to providing a market update for a chosen commodity. These reports are designed to be accessible and relevant for a range of audiences, including supply chain decision makers, procurement officers, policy-makers and producers. The series builds on *The State of Sustainable Markets 2018: Statistics and Emerging Trends*, a joint publication from IISD, the International Trade Center (ITC), and the Research Institute of Organic Agriculture (FiBL), which examines over a dozen sustainability standards for various commodities.

This *Global Market Report* analyzes recent trends in sugarcane production, consumption, trade flows and other relevant areas. The report also emphasizes the potential for expanding VSS-compliant production in low human development countries, given factors such as share of global sugarcane production, VSS presence and Human Development Index value. It uses 2016 data across all three factors, given that this is the latest year with data available for VSS-compliant sugarcane when conducting the analysis. By comparing the growth rates and patterns of standard-compliant versus conventional consumption and production of sugarcane, this report provides insights on how sustainable and conventional markets are performing at a global level and highlights which countries have the potential to produce more VSS-compliant sugarcane.

The State of Sustainability Initiatives (SSI) is an international transparency and capacity-building project that aims to improve strategic planning and sustainable development outcomes related to VSSs. It does so by providing in-depth, credible and needs-based information on VSS characteristics, market performance and potential contributions to addressing development challenges.

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