

WHITE PAPER

THAI SUGARCANE SECTOR & SUSTAINABILITY



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Please note that the interpretations and text in this document are those of the author and do not necessarily reflect the views or opinions of Bonsucro or its members.

GLOSSARY

AEC: ASEAN Economic Community

AFTA: ASEAN Free Trade Agreement

ASEAN: The Association of South East Asian Nations

CCS: Commercial Cane Sugar

EIMP: Environmental Information and Monitoring Program

MOAC: Ministry of Agriculture and Cooperatives

MT: Metric Tonne

MTRV: Metric Tons Raw Value

OCSB: Office of the Cane and Sugar Board

PPP: Public-private partnerships

RID: Royal Irrigation Department

TCSC: Thai Cane and Sugar Company Limited

EXECUTIVE SUMMARY

This white paper was written to provide Bonsucro and other stakeholders with top-line information regarding the Thai sugarcane industry based on up-to-date market intelligence, technical data, and relevant government policy. The data collected in the report was further contextualised through focus group discussions and interviews with representatives from the sugarcane industry, non-profit organisations, academic institutions and government sectors of Thailand, as well as an online survey. As part of the consultation, stakeholders identified some of the social, economic, and environmental challenges in the Thai sugarcane industry, as well as key opportunities for driving the sustainability agenda forward using the Bonsucro Production Standard as a reference point.

Market Overview

Sugarcane is one of Thailand's most important agricultural crops and critical to its economy. The sugarcane supply chain - consisting of the growers, millers and associated logistics personnel - provides jobs for more than 1.5 million people and generates almost \$6 billion USD per year. Additional revenue is generated downstream through the use of by-products and excess materials from the sugar industry in the form of ethanol, biomass electricity, paper pulp, fertiliser and other products.

The Thai sugar industry is highly competitive, both domestically and in the world market. For decades, governmental policies like The Cane and Sugar Act supported the industry and helped to stabilise the sector, enabling sugarcane mills to maintain their profitability even during times of depressed sugar prices in the world market. More specifically, the quota system guarantees the availability of sugar for domestic consumption, and the government provides a mechanism for the fair distribution of income between cane growers and millers—70% and 30%, respectively. The domestic price is capped to ensure the steady supply of sugar for domestic consumption as well as income for the industry and cane growers.

At the production level, costs (excluding transportation) in Thailand are generally lower than their competitors and the season of production (November to April) reduces competition in the export market. However, Thai sugarcane mills are faced with high variation in output due to climate change. Given that Thai cane areas are rain-fed with only 10% in irrigated zones, it is projected that severe drought will continue to cause damage to the sugarcane in the next 2 years.

It is yet to be seen if the system will continue to have the same effect on the industry.

Exports

After two decades of considerable growth in the export market, Thailand now exports as much as 70-75% of total domestic sugar and is the world's second-largest exporter after Brazil. Major export destinations are within the ASEAN markets where Thailand is able to benefit from lower tariffs due to the free trade agreement and lower transportation costs due to the proximity of major export destinations like Indonesia and China where demands for imported sugar are increasing.

Challenges

However, beyond these advantages, new challenges are arising for modern and sustainable agriculture, with a growing need to monitor and improve environmental sustainability, social impact, and economic performance. At the same time, limited law enforcement remains a challenge, as well

as limited environmental and social monitoring at the farm level (e.g. Health & Safety, labour regulations, biodiversity and ecosystem impacts including Environmental Information and Monitoring Program (EIMP)/Nitrogen & Phosphorus (N&P)/Agrichemicals). At a system level, little global research on the economics and techniques of cane growing impedes the emergence of innovative and well-balanced solutions for each of the various types of farmers.

Recommendations

Bonsucro offers a logical framework to measure environmental, social and economic indicators and through its collaborative platform, helps facilitate a comprehensive value chain approach to allow growers, producers and buyers to speak the same language using comparable metrics and tools to measure and monitor performance. As more sugarcane stakeholders use the framework, the ability to monitor environmental, social, and economic outcomes from the sugarcane sector will improve and become easier for stakeholders to use (and refer to). Actions identified as having the potential to positively affect the sugarcane sector are:

- ✓ Mechanisation of harvest
- ✓ Dedicated investment schemes for improvement
- ✓ Environmental monitoring and management
- ✓ Increased economic research and financial risk modelling
- ✓ Farmer training in good agriculture practices and data collection

To maximise the potential of the sector and implement changes, core capacity building programmes are needed to build industry knowledge, with financial mechanisms put in place to enable investment. Access to loans or other financial tools (or incentives) are also needed to support mechanisation, irrigation and/or the adoption of other technologies to drive improved quality and productivity including innovative incentives directed towards farmers and millers to reduce the environmental footprint of sugarcane.

Improved stakeholder engagement: government and farmers

To address some of the biggest challenges in the sugarcane industry, greater engagement and collaboration is needed across the supply chain, and with the Government of Thailand and farmers in particular. In relation to the Government, stakeholders informed that better policy and technical support was needed. Specific areas of support required from government included:

- ✓ Evaluating water quantity use and permitting capacity to provide sufficient water supplies without draining aquifer reserves.;
- ✓ Supporting financial mechanisms for investments;
- ✓ Implementing monitoring mechanisms from both product quality perspective as well as human resource and social aspects; and
- ✓ Restricting/banning the burning of cane, with financial support for mechanisation provided.

To achieve these ambitions, farmers need to adopt new, more sustainable farming practices — something that they are often slow in doing because of the potential risk involved, the lack of technical knowledge and/or ability to invest in required inputs. The development of a pilot or test group of farmers was recommended as the best way to demonstrate impact, with farmers collecting and communicating outcomes along the way. Any lessons learned with the pilot group could then be used to scale the adoption of sustainable practices along with other Bonsucro improvement programmes.

THAI SUGARCANE SECTOR AND SUSTAINABILITY

This white paper provides a high-level overview of the Thai sugarcane industry and identifies key opportunities for driving the sustainability agenda forward using the Bonsucro standard as a reference framework. It is based on data collected from a desktop review of up-to-date market intelligence, technical data, and government policy, as well as from insight acquired through stakeholder engagement in the form of interviews, focus group discussions and questionnaires.

1. METHODOLOGY

1.1 MARKET RESEARCH AND ANALYSIS

Market research was based on a desktop review of up-to-date market intelligence, technical data, and relevant government policy, including available literature on social, environmental and economic aspects of sugarcane production in Thailand.¹

Table 1 - Objectives of the white paper study

<p>Identification of key stakeholders</p>	<ul style="list-style-type: none"> • Key stakeholders in/outside Thailand identified and invited to participate in interviews, focus group discussions and/or questionnaire. • Criteria for selection – ability to enable/influence the sector in relation to sustainable performance: environmental, social, and economic impacts.
<p>Thai sugarcane market analysis</p>	<ul style="list-style-type: none"> • National significance of sugarcane in relation to employment, GDP, land area, foreign exchange, water use and impact, as well as other potential issues of importance. • Economic performance of milling groups and farmers (high-level assessment), specifically farmer livelihoods (annual income), input optimisation and costs (e.g. fertiliser and pesticide use), as well as farm productivity and diversification. • Geopolitical factors and other related issues affecting South-east Asian countries, including potential impacts of the ASEAN free-trade agreement.
<p>Consideration of key sustainability factors</p>	<ul style="list-style-type: none"> • Key drivers affecting the sugarcane sector in relation to social, environmental and economic factors of production/processing; • Gap analysis of main sustainability indicators as defined in the Bonsucro Production Standard (six main principles). • Outlook on the potential expansion of sugarcane into natural habitats, areas where land tenure conflicts exist, and arable land where sugarcane will compete with other crops.

¹ Research was conducted in February 2017.

1.2 STAKEHOLDER ENGAGEMENT

To help contextualise the information acquired through the desktop review, key stakeholders with the ability to enable and/or influence the sugarcane industry in relation to social, environmental and economic performance were identified and invited to participate in interviews, focus group discussions, and/or questionnaires. An additional workshop session was included as part of Bonsucro's Technical training week in Thailand, with comments integrated into the consultation feedback.

Those participating in the consultation included representatives from the sugarcane industry, non-profit organisations, academic institutions and government sectors of Thailand. Information and insight acquired through this process were critical for identifying and analysing key aspects of the sugarcane industry and used to identify various social, economic, and environmental opportunities and challenges in the Thai sugarcane industry at the farm, mill and market (trade) level.

A) Questionnaire

In early 2017, a questionnaire on sustainability in the Thai sugarcane sector was drafted and circulated online in Thai and English to key stakeholders located in and outside of Thailand (Annex A). The aim of the questionnaire was to:

- ✓ Engage with selected representatives from industry, not-for-profit organisations, and Governmental agencies;
- ✓ Explore opportunities and challenges in sustainability (and implementation) in Thailand; and
- ✓ Identify gaps and key drivers affecting the sugarcane sector in relation to social, environmental and economic issues.

A total of 24 questionnaires were returned and to encourage open feedback, they were anonymous.

B) Focus group discussions

In parallel with the questionnaire, several focus group discussions were organised with 32 participants (see Appendix B). For those unable to attend the pre-scheduled focus group, either a specific focus group was organised or individual interviews were set, in person or over the phone.

A range of participants was selected to reflect the views from across the sugarcane industry as well as key stakeholder groups from the following:

- ✓ Sector representatives and industry experts (16 people from 11 organisations), both related and non-related to the sustainability area;
- ✓ Not-for-profit representatives (8 people from 3 organisations) with strong involvement and knowledge of the sector; and,
- ✓ Governmental agencies representatives (8 people from 5 organisations), including those from academia and research institutions.

C) Technical week workshop

In May 2017, FairAgora facilitated a workshop session with participants from Bonsucro's Technical training in Thailand.² The aim was to present findings of this White Paper as well as to get input on the key challenges and opportunities facing mills and farms in Thailand, plus

² Technical week was held from May 22 to May 27 in Thailand (2017). The FairAgora workshop was on the afternoon of May 26.

recommendations for actions to be taken by Bonsucro (and other stakeholders) to address. These opportunities and challenges were then framed in the context of Bonsucro’s Production Standard to better understand the level of readiness (or compliance) at mill and farm level. In total, 20 participants from the technical training attended the workshop (18 were representatives of the sugarcane industry – primarily mills; along with one farmer and a consultant).

2. SUGARCANE PRODUCTION IN THAILAND

2.1. SUGARCANE CULTIVATION

In Thailand, sugarcane is cultivated in 47 provinces and covers about 8% of the total agricultural land.³ Production is divided into 93% of the plantation for crushing at the sugar mill and 7% of the plantation for seedlings⁴ for field planting and planting area is in compliance with the Notification of the OCSB.⁵

The sugarcane crop cycle varies by region depending on the variety of cane planted as well as the region of production. For example, sugarcane growers in the north-eastern region plant their cane in October or November, while in the eastern and central regions, planting is in from November to February. It takes anywhere from 10 to 14 months to sugarcane to mature for harvesting.

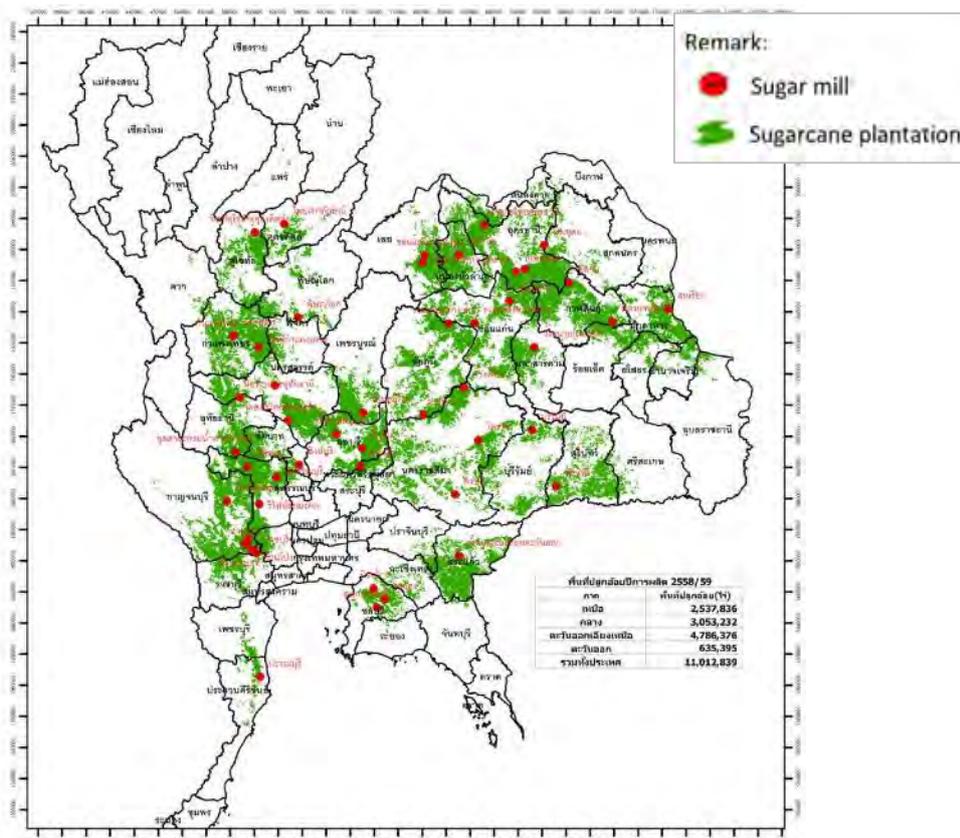


Figure 1 - Location of sugarcane growing areas and sugarcane mills in Thailand (2016).

Source: Sugarcane production annual report 2016, OCSB.

³ Exact area under sugarcane cultivation is 1,776, 264 ha. Agricultural land of Thailand: 24 million ha (47% of Country’s total land)

⁴ 2016 OCSB Sugarcane production report

⁵ OCSB Notifications - The Zoning of Sugarcane Cultivation and the Notification of National Environment Board No. 25 entitled Soil Quality Standards.

A) Zoning

In 2012, the government of Thailand initiated the “Agricultural Crop Zoning system”, which established different agricultural production zones based on several factors, such as land suitability factors (soil, water, and sunlight), existing land use, crop requirements, and market demand. The zoning policy encouraged farmers to switch from rice cultivation to the production of ‘cash crops’ such as cassava, palm oil, sugarcane, maize, etc. in order to support bioethanol production.⁶ Even though the area planted with rice has decreased as a result of the policy, Thailand remains the biggest producer and exporter of rice worldwide.

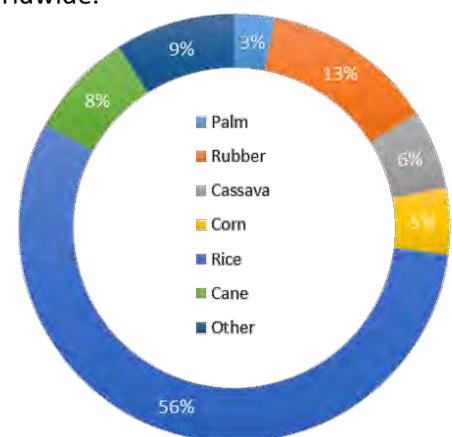


Figure 2 - Main commercial crops of Thailand

Source: Office of Agricultural Economics

The relatively high price of sugarcane compared to other crops made it more attractive to farmers, resulting in a significant expansion of sugarcane cultivation by an average of 8% per year since 2010.

B) Farm size

The majority of sugarcane farms are small and medium farms, 52% and 31%, respectively with an annual production capacity from about 1,000 to 2,000 MT. Only 17% of farms are considered large, with their annual production more than 2,000 MT. Nearly half of the small sugar farms are in the North-eastern region, which is a new location for sugarcane plantations.

Table 2 - Sugarcane production by farm size and region in Thailand (2014)

Typology	Planted area (ha)	Production capacity (MT/year)	Sugarcane farmers by region				Total (by typologies)
			Northern	Central	Western	North-eastern	
Small	< 10	> 1,000	45%	47%	21%	67%	52%
Medium	10 - 32	1,000 - 2,000	40%	35%	44%	20%	31%
Large	> = 32	> 2,000	15%	19%	35%	13%	17%
Total (by regions)			22%	33%	6%	39%	100%

Source: Survey of Khon Khaen University, 2014.

⁶ Government policy & Environmental sustainability and climate benefit of green technology for bioethanol production in Thailand, Kawasaki ET AL, 2015

C) Production and yield

With the increased acreage, sugarcane production climbed about 4% per year until 2015. In a normal season, sugarcane farmers produce about 100 to 105 million MT of sugarcane per annum with an average annual productivity of 60 to 65 MT/ha (as measured from 2010 to 2015). The highest annual productivity was 80.3 MT/ha in 2012 in the Northern region.

In 2016, sugarcane production dropped to 94.04 million MT, a decrease of 11% compared to the record of 2015 due to the climate change impact (severe drought). The Thai Meteorological Department reported that cumulative precipitation in major growing areas at that time was 30 to 50% lower than the previous year.

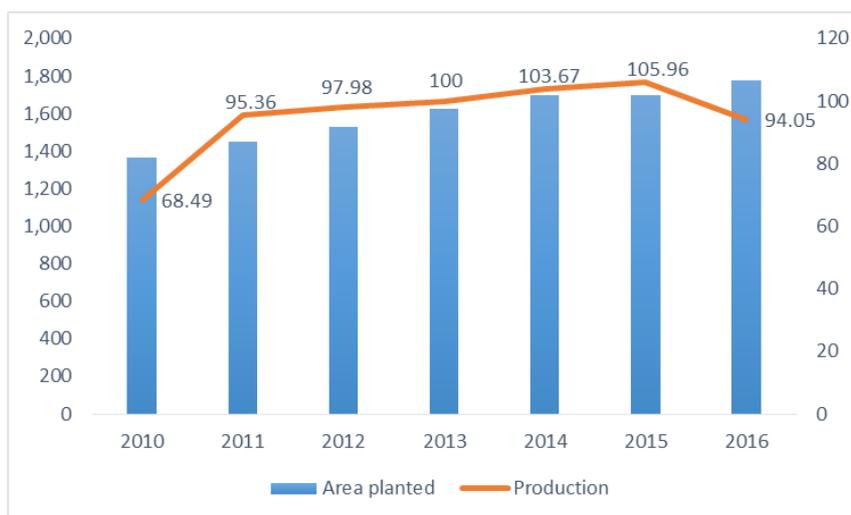


Figure 3 - Sugarcane planted area (1000 Ha) and production (1000 MT) from 2010 to 2016.

Source: Crushing Report 2016, Office of the Cane and Sugar Board (OCSB), Ministry of Industry

As presented in Figure 3, the yield of sugarcane has decreased since 2015. In addition to water, temperature and sunlight are other factors affecting yield, quality and harvest of sugarcane. The main reason for low yields is due to the water shortage and drought. In Thailand, most cane-growing areas are rain-fed (only 10% are planted in irrigated zones), especially in the Northeastern and Central regions where the major cane growing areas are found. It is projected that severe drought will continue to decrease yields over the next 2 years.

Cane burning could also be a contributing factor as it is known to lower biodiversity in the soil, leading to soil erosion and exhaustion over time. However, it is still widely used (in 65% of production) due to labour shortages as more than 90% rely on manual harvesting.

Forecast/production outlook

Sugarcane production in 2017 is forecast to reach 91.05 million MT (or 9.1 to 9.2 million MT of sugar), which is 3 million MT lower than the previous year. This decline is due to drought early in the growing season and excessive rain during the harvest season. It is projected that severe drought will continue to damage sugarcane production for the next two years.

2.2 ETHANOL

The majority of sugarcane in Thailand is used for sugar production but a small amount – ranging from 1 to 6% - is used for ethanol production, which varies annually depending on world sugar prices and relative profitability of sugar over ethanol. This accounts for around 30% of total ethanol production in Thailand.

Thai producers have a production capacity of around 4.44 million litres of ethanol per day. Ethanol production in 2014 was 1,058.3 million litres, an 11.5% increase from 2013.

Presently, there are 24 ethanol production plants in Thailand.

These plants produce ethanol from sugar, molasses, and cassava. The registered daily production capacity is about 5.04 million litres and the actual production is 4.4 million litres. The ethanol production from sugar juice and molasses is 2.3 million metric tonnes per day, which is managed by 11 ethanol processors.

Molasses

Molasses is commercialized both for the domestic and export markets. For the domestic market, molasses is used in various industries, such as liquor distilleries, monosodium glutamate production, ethanol production, animal feed industry, and other industries. Thailand mainly exports molasses to South Korea, Vietnam, and Taiwan.

A) Domestic consumption

Ethanol consumption jumped to 3.2 million litres per day in 2014, up 23.1% from 2013. Ethanol consumption reached 3.5 million litres per day in the first four months of 2015 - 9.4% greater than the same period a year earlier. The production of ethanol is projected to rise because demand is growing.

Table 3 - Ethanol consumption (million litres/day) 2013 - 2015

Year	Ethanol consumption (million litres/day)	Ethanol production (million litres)
2013	2.6	936.5
2014	3.2	1,058.3
2015	3.5	405.3 (YTD - April 2015)

Source: Department of Alternative Energy Development and Efficiency (DEDE)

B) Gasohol

The use of ethanol as a fuel is expected to grow continuously due to supportive government policies that encourage people to use alternative fuels. Ethanol, when blended with gasoline in different proportions, is called gasohol. Gasohol used in vehicles in Thailand comes in three grades: E10 (a 10:90 mixture of ethanol and gasoline), E20 (20:80), and E85 (85:15). The retail price of gasoline for automobiles in Thailand is higher than the price of gasohol because the price of gasoline includes a higher contribution to the Oil Fund. By the end of June 2015, the E20 gasohol price was 23.5% cheaper than gasoline. The demand for gasohol and ethanol rose significantly since January 2013 after the sale of 91-octane gasoline was banned.

3. SUGARCANE PROCESSING IN THAILAND

3.1 SUGARCANE MILLS

Sugarcane mills in Thailand employ an estimated 50,000 workers in 27 different provinces. The majority (nearly 75%) are in the Central and North-eastern regions (see Figure 4). There are currently 55 OCSB registered sugarcane mills operating in Thailand.⁷ These mills are owned and operated by 22 companies. The top 5 companies produce over 60% of the market share of sugar sold in the domestic market under the Quota A allocation (white sugar for domestic consumption).

The Mitr Phol and Thai Roong Ruang Group are the largest of the processor companies, accounting for 20% and 14% of total production capacity of sugar in the country, respectively. Both are also major exporters of sugar and ranked 3rd and 4th of all sugar exporters in the world market.⁸



Figure 4 - Sugarcane mills by regions (2015).

- Mitr Phol - 6 sugarcane mills in Thailand, all located in the Northern region. All mills have refineries attached and produce white sugar with a total processing capacity of 130,500 MT of sugarcane daily, yielding a sugar output of approximately 2 MT per year. Mitr Phol operates globally, with 10 additional mills in 4 countries.⁹
- Thai Roong Ruang Group - 9 sugarcane mills in Thailand, 2 of which were recently established in 2015 and 2016. All mills have refineries attached and produce white sugar, with a crushing capacity of 264,435 MT of sugarcane daily. The yielding sugar output is approximately 2 million MT.

Table 4 - Thai sugar processors and crushing capacity (2015)

	Company name	Number of mills	Annual crushing capacity (MT of sugar)
1	Mitr Phol Group	6	20.68
2	Thai Roong Ruang Group	7	15.19
3	Thai Ekalak Group (KTIS)	3	9.8
4	Tamaka Group (KSL)	5	8.75
5	Korach Group	2	5.84
6	Rerm Udom Group	2	5.72
7	Wang Kanai Group	4	5.45
8	Suphanburi Group	1	5.25
9	Banpong Group	4	4.26
10	Kumpawapi Group	2	3.8
11	Kam Pang Petch Co.,Ltd.	2	3.55
12	Thai Kanchanaburi	2	3.16
13	Mitr Kasetr Group	2	2.35
14	Prachuap Sugar Industry Co.,Ltd	1	2.29
15	Rajburi Sugar Co.,Ltd.	1	2.15
16	Pranburi Sugar Industry Co.,Ltd.	1	1.95
17	Eastern Sugar & Cane Public Co.	1	1.36
18	Rayong Sugar Co.,Ltd.	1	1.26
19	Khonburi Sugar Public Co.,Ltd.	1	1.03
20	Saharuang Co.,Ltd.	1	1.01
21	E - Saan Sugar Industry Co.,Ltd.	1	0.59
22	Burirum Sugar Public Co.,Ltd.	1	0.52
	Total	51	105.96

⁷ Four new plants were established in 2016: two sugar mills by the Thai Roong Ruang Group and 2 other new mills with the total crushing capacities of 40,000 MT of cane per day.

⁸ World Top Export, 2016.

⁹ Mitr Phol operates 7 sugar mills in China and 1 sugar mill in each of the following, Laos PDR, and Australia (in partnership with MSF Sugar Limited).

3.2 CRUSHING CAPACITY

The average annual crushing capacity of sugarcane mills in Thailand is between 100 to 106 million MT of sugarcane (or equivalent to sugar output of 10 to 11 million MT). The extraction rate is between 100 to 108 kg of sugar per MT of sugarcane with an average of 104.73 kg of sugar per MT of sugarcane.

Table 5 - Yield of Sugarcane and sugar (2007–2016)

Year	Sugarcane production (million MT)	Sugar production (million MT)	Extraction rate (kg sugar/t cane)	C.C.S (%)
2007	63.79	6.72	105.33	11.91
2008	73.31	7.80	106.63	12.10
2009	66.46	7.19	108.13	12.28
2010	68.48	6.93	101.17	11.58
2011	97.98	10.24	104.47	12.04
2012	95.36	9.66	101.33	11.78
2013	100.00	10.02	100.24	11.64
2014	103.67	11.33	108.94	12.56
2015	105.96	11.34	107.01	12.23
2016	94.04	9.78	104.05	11.95

Source: Crushing report 2016, OCSB, Ministry of Industry

In 2016, sugar production dropped significantly from 11.34 million MT to 9.78 million MT due to the decrease in sugarcane production. The extraction rate was also 2.7 kg less at 104.05 kg of sugar per MT of sugarcane, (approximately 3% lower) due to the dry weather conditions.

Forecast/outlook

Under the 10-year Cane and Sugar Strategy (2015 – 2026), the Thai government approved the construction of 13 new sugarcane mills in 2016 and allowed the expansion of 6 existing sugarcane mills. The expansion is expected to increase the production capacity by 466,300 MT of sugarcane per day, leading to a daily capacity of at least 1.1 million MT.

Table 6 - Expansion of sugarcane mills and capacities (2016-2021)

Name of Factory	Capacity Expansion (tonnes/day)
Old Permits for Thai Sugar Mills for 2010-2015 and expiration in 2016 without operation	93,500
1 Suphanburi Sugar Industry Co.,Ltd	18,000
2 Thai Sugar Industry Co.,Ltd	26,000
3 Thai Sugar Mill Co.,Ltd.	20,000
4 Korach Industry Co.,Ltd	8,500
5 Eastern Sugar and Cane Co.,Ltd	10,500
6 Thai Rung Ruang Industry Co.,Ltd	10,500
New Permits for Thai Sugar Mills for 2016-2021	186,800
1 Mitr Kalasin Sugar Co.,Ltd.	5,000
2 United Farmer& Industry Co.,Ltd. (Phu Viang Branc	5,000
3 Burirum Sugar Public Co.,Ltd.	11,000
4 United Farmer & Industry Co.,Ltd. (Chaiyaphom)	14,000
5 Phitsanulok Sugar Co.,Ltd.	22,000
6 Khon Kaen Sugar Industry Public Co.,Ltd.	14,600
7 Kam Pang Petch Co.,Ltd.	19,000
8 Kaset Phol Sugar Limited	18,000
9 Thai Roong Ruang Industry Co.,Ltd.	31,000
10 Baanrai Sugar Industry Co.,Ltd.	20,000
11 Kaset Thai International Sugar Corporation Public Co.,Ltd. (Amphur Muang, Nakorn Sawan)	10,000
12 Kaset Thai International Sugar Corporation Public Co.,Ltd. (Amphur Takhli, Nakorn Sawan)	7,200
13 Surin Sugar Co.,Ltd.	10,000
Total	280,300

Source : Office of The Cane and Sugar Board

4. THE SUGARCANE SECTOR IN THAILAND

4.1 ORGANISATION OF THE SUGARCANE SECTOR

The sugarcane sector and sugar industry in Thailand have been highly regulated by the government since the approval of the Cane and Sugar Act in 1984 (B.E. 2527). This Act aims to maintain the economic stability of the country and safeguard the interests of sugarcane farmers in the production and distribution of sugarcane. The continued growth and stability of the sugar industry ensures regular incomes to cane growers and sugar mill owners while providing price stability to consumers. In addition, it allows sugarcane mills to maintain their profitability even during times of depressed sugar prices in the world market. Under this Act, various support measures have been put in place through the Office of the Cane and Sugar Board (OCSB) under the Ministry of Industry, a mediation body to bridge sugarcane growers and sugarcane mills.

The main features of the Cane Sugar Act include the control of sugarcane production, the allocation of sales quotas, the setting of prices for sugarcane and sugar, and a revenue sharing system (described below).

A)Control of sugarcane production

Currently, there are 336,851 sugarcane growers (or planters) which belong to 33 sugarcane associations. All sugarcane planters who wish to sell their produce to a sugar mill must be formally

registered as a “sugarcane planter” by the OCSB. The majority of sugarcane planter’s associations (27 of 33) fall into one of three sugarcane federations. The remaining 6 associations operate independently (Figure 2). At the end of the supply chain, there are 7 sugar trading companies operating both as traders and shippers and are grouped under a trade association.

All sugarcane grower associations must fully meet the registration criteria:

- (i) consist of at least 600 members, and
- (ii) supply at least 55% of their production to a sugar mill.

Sugarcane mills and traders must be licensed to operate. In April 2015, a new requirement for factory licensing was announced as part of a government programme to increase capacity by increasing the number of mills. The minimum distance between new and existing sugarcane mills was revised from 80 km to 50 km and the construction of any new sugar mill must be completed within five years. The registration is managed by a different bureau of the OCSB.

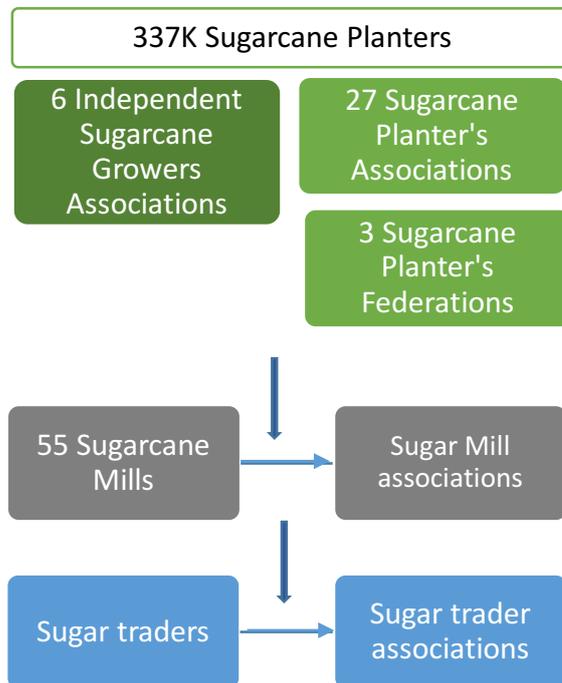


Figure 5 - Organisation of Thai sugarcane sector by planters, mills and traders

B) Contract farming

In Thailand, only a few sugarcane mills operate and own their own plantations, with the majority sourcing from contracted sugarcane growers. In general, the sugarcane mills support the contracted farmers in terms of inputs (cane varieties and fertilisers), farm equipment and mechanisation services, and short-term financing. The general practice is for sugarcane mills to sign a contract with the leader (or quota head) for the sugarcane growers. The quota head, who is often a sugarcane grower with a large cane area, supervises the cane provided by sugarcane growers in his network (or *look rai*). The number of contracts issued by the mills ranges from 2 to 77 quota heads per mill with an average of 50 quota heads.

C) Allocation of sales quotas

Sugar is categorised as a controlled good under governmental regulations. The OCSB allocates the quantity of sugar sold domestically and for export into 3 Quotas: A is for sugar sold domestically; B is for export under the industry’s long-term contracts; and C is for export under the individual export contracts - shorter term contracts allocated after A and B are fulfilled.



Figure 6 - Allocation of sugar quotas A, B and C.

These quota allocations are intended to control excess sugar output. However, as exports are measured in calendar years (January-December) while production is by crop year (October-September) there is a slight difference between the export quota and the actual shipment volumes.

D) Setting prices for sugarcane and sugar

The price of sugarcane is pre-determined on an annual basis by the OCSB and announced in October. Before the start of sugar production every year, the OCSB estimate the revenue from the sale of sugar to set the initial sugarcane price. This price is used by the sugar millers as a basis for calculating the initial price paid to sugarcane planters. At the end of the sugar production cycle, which is usually around September, the OCSB will re-evaluate the revenue from the sale of sugar and announce the final sugarcane price. If the actual final price, based on actual world price, is lower than the initial price set by OCSB, the Cane and Sugar Fund compensates the millers for the shortfall. However, If the final sugarcane price is higher than the initial price, the millers compensate the sugarcane planters.

The domestic sugar price is also controlled by the Ministry of Industry (via the OCSB) and the Ministry of Commerce. The OCSB establishes the sugar price at the factory gate and the Central Board pricing of goods and services establishes the retail price of sugar. In 2016, the factory wholesale price of refined sugar was 19 THB/kg¹⁰, excluding the 7 % of VAT. Retail prices for sugar also remain fixed at 21.85 THB/kg¹¹(including VAT) for white sugar and 22.85 THB/kg¹² for refined sugar. These prices are higher than the world price resulting in a competitive advantage for Thai sugar businesses over international competitors in the domestic market.

E) Revenue sharing system:

In 1984, the OCSB established a profit-sharing system between sugarcane planters and sugarcane mills at 70:30 based on actual income (after deducted costs and taxes) from both domestic and export markets. This is used to stabilise costs arising from milling, transportation and other associated costs.

¹⁰ Approximately \$0.24 USD/lb

¹¹ Approximately \$0.28 USD/lb

¹² Approximately \$0.30 USD/lb

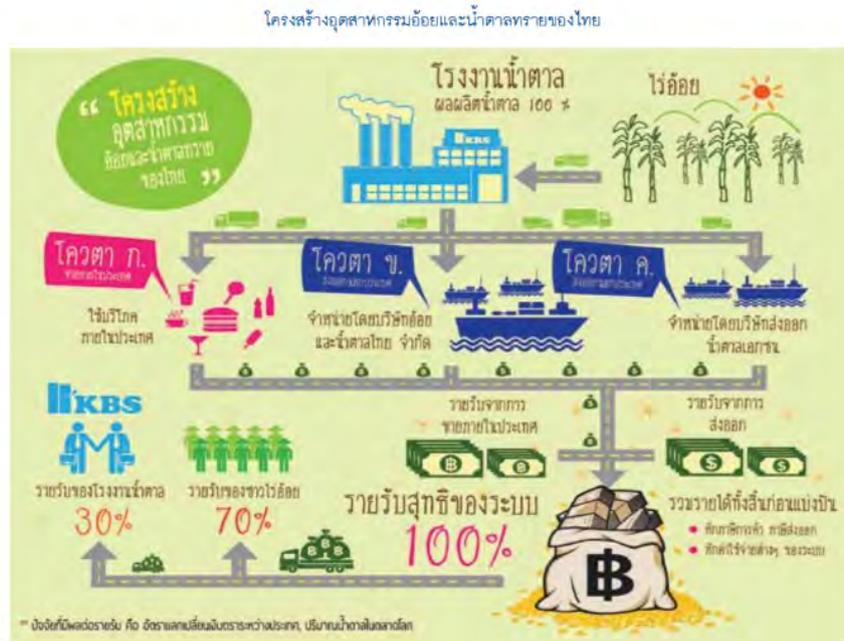


Figure 7 - Benefit allocation scheme between sugarcane farmers and sugarcane mills

Source: KBS Annual Report, 2015.

The benefit allocation scheme between sugarcane farmers and sugarcane mills is 70:30. This means that 70% of the industry's net profit is allocated to sugarcane farmers and 30% to sugar companies. After the end of each production season, Quota B is determined by the Cane and Sugar Board and the Executive Board calculates the final sugar price from the net profit that is accrued in that production year.

4.2 WTO COMPLAINT

In April 2016, Brazil challenged Thailand's profit sharing system when it initiated consultations at the World Trade Organisation (WTO). According to Brazilian officials, the profit-sharing system (along with export quotas and high fixed domestic prices), is an irregular subsidy that artificially incentivized the production of sugar during a period of record level low prices and benefitted Thailand at the expense of other producing countries and in violation of global trade agreements.¹³ The case is similar to one successfully disputed by Brazil against the EU sugar regime more than a decade ago in 2005 forced the EU to review its sugar policies.

Since the initial complaint by Brazil, Guatemala and the European Union also joined the process. In September 2016, Thailand agreed to overhaul its sugar production and its distribution system for the first time in more than three decades. The OSCB discussed the issue with Brazil and agreed (in principle) to revoke its current 70:30 profit-sharing system and subsequently lead to cancelling its quota system and floating domestic sugar prices.¹⁴

Although the new law and regulations are expected to be applied to the 2017/18 crops, it is not yet clear whether these measures will be sufficient to prevent the consultation at the WTO from moving forward. As of May 2017, the WTO had not yet been notified of the agreed solution.

¹³ Available at - https://www.wto.org/english/tratop_e/dispu_e/cases_e/ds507_e.htm.

¹⁴ Available at <https://www.international-sugar-journal.com/thailand-to-reform-its-sugar-regime/>

4.3 CONSUMPTION AND TRADE

Sugar consumption in Thailand is classified as direct or indirect consumption. Based on the 2.6 million MT of domestic consumption in 2016, the ratio was 52.24% for direct consumption versus 47.76% for the indirect consumption (used by the industry). This was in the same proportion as the previous year.

A) Domestic consumption

The domestic consumption accounts for 25 to 30% of the total sugar output. The sugar quota for domestic consumption falls into Quota A: white sugar for domestic consumption only slightly increased from 2.30 million MT in 2012 to 2.60 million MT in 2016, up 15% from 2012 and 4% from 2015. This is due to growing household and industrial uses and the anticipation of a slight improvement in the economy.

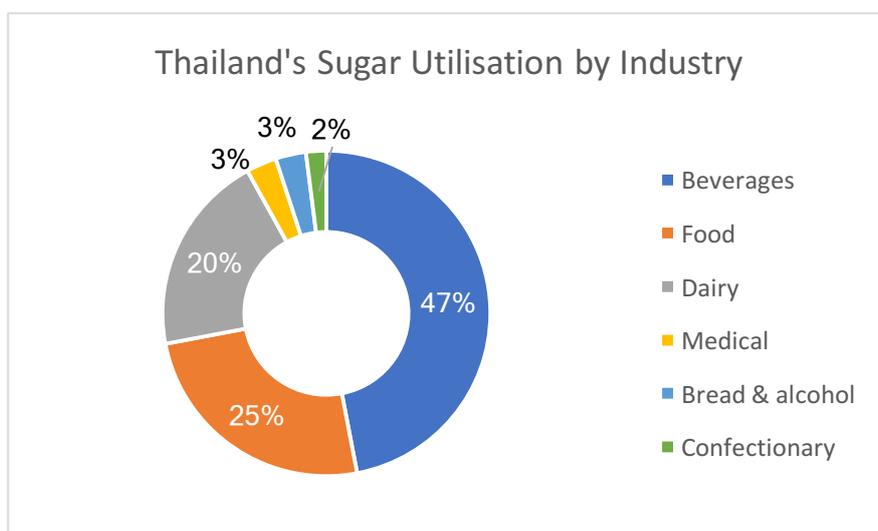


Figure 8 - Sugar use by industry in Thailand (2016).

Source: USDA: Thai sugar annual report 2016

For industrial uses, over 90% of sugar is used in beverages (excluding alcoholic drinks), food, and dairy, at 47%, 25% and 20%, respectively. Other uses include other dairy products, medical (pharmaceutical products), and confectionary products.

Table 7 - Allocation of sugar quota (million MT), 2012 to 2016

Year	Total sugar production (million MT)	Quota A ⁽¹⁾ (million MT)	Quota B ⁽²⁾ (million MT)	Quota C ⁽³⁾ (million MT)
2012	10.24	2.30	0.8	7.14
2013	10.02	2.61	0.8	6.61
2014	11.33	2.40	0.8	8.13
2015	11.33	2.50	0.8	8.03
2016	9.78	2.60	0.8	6.38

⁽¹⁾ Quota A: white sugar for domestic consumption only; ⁽²⁾ Quota B: 0.8 million MT of raw sugar for export only

⁽³⁾ Quota C: balance remaining after Quota A and B for re-export.

Source: Crushing Report 2016, Office of the Cane and Sugar Board (OCSB), Ministry of Industry.

B) Export Market

Thailand remains a major sugar producer and is the world’s second-largest exporter after Brazil. Sugar exports increased from 7.57 million MT in 2014 to 8.27 million MT in 2015, rising by 9.24% (mostly in the form of raw sugar exports). With the quota system established by the government, Thai sugar production relies heavily on exports - as high as 70 to 75% of total sugar output.

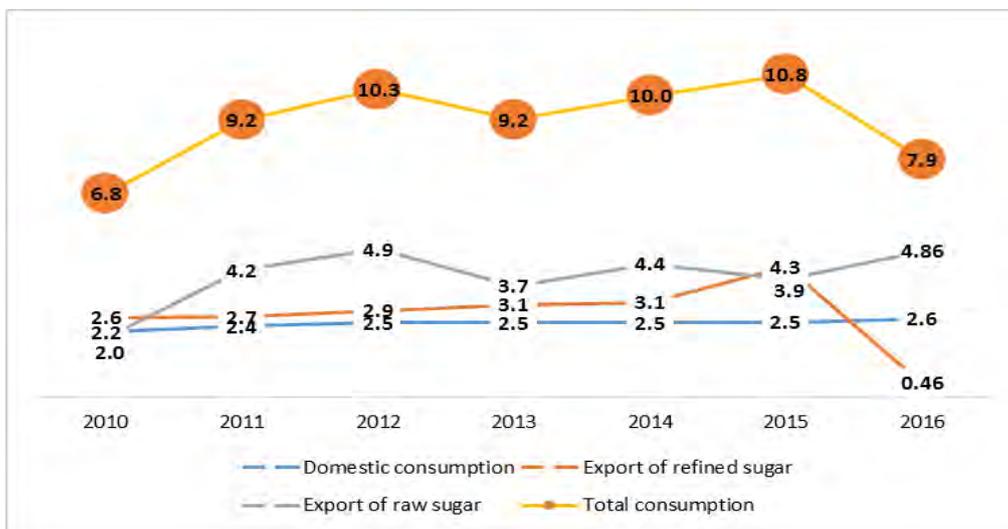


Figure 9 - Thailand's domestic consumption and exports of sugar (MT), 2010 – 2016.

Source: USDA: Thai sugar annual report 2016

More than 90% of Thailand’s sugar exports are sold to Asian countries, resulting in a cost competitive advantage for Thailand compared to other global exporters mainly due to preferential terms of trade under the ASEAN Free Trade Agreement (or AFTA). In effect since December 2015, AFTA gives Thailand duty-free access to most ASEAN markets, except for the Philippines (5% duty on sugar imports) and Indonesia (variable rate of 5 to 10%), and Myanmar (variable rate of 0 to 5%). Thailand also benefits from lower transportation costs due to its geographical location and proximity to export destinations. The overall cost savings amounts to about 15 USD per MT compared to non-ASEAN suppliers.

Table 8 - Thailand Export data of sugar (mill tonnes) 2010 – 2016

Year	Raw sugar (mill tonnes)	Refined sugar (mill tonnes)	Total (mill tonnes)
2010	1.97	2.65	4.62
2011	4.22	2.66	6.88
2012	4.92	2.88	7.80
2013	5.99	3.08	6.79
2014	3.70	3.14	7.57
2015	4.43	4.34	8.27
2016	4.4	0.46	4.86

Source: Thailand Sugar annual report 2016, USDA



Figure 10 - Export markets for raw sugar (% share of market) in 2016

Source: Thailand Sugar annual report 2016, USDA.

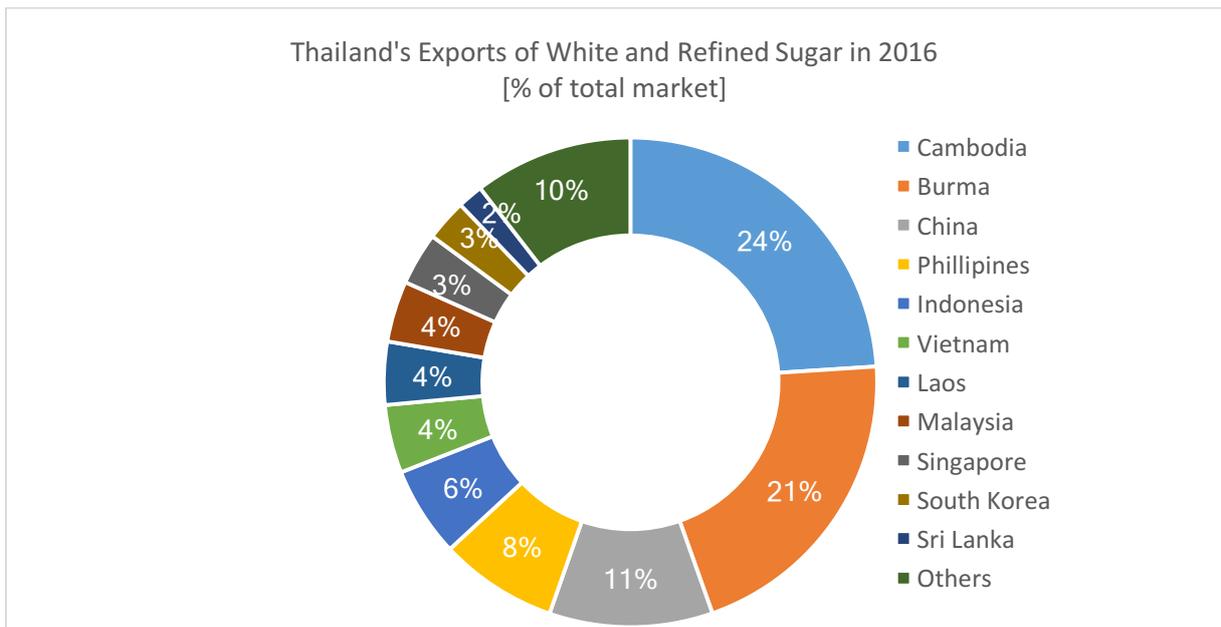


Figure 51 - Export of white and refined sugar (% share of market) in 2016.

Source: Thailand Sugar annual report 2016, USDA.

Table 9 - ASEAN sugar balance prospective to 2020 (8.5 million MT deficit per year).

Country	Sugar production (million MT)	Sugar consumption (million MT)	Supply/Demand
Thailand	13.00	3.67	+ 9.33
Philippines	2.60	2.75	- 0.15
Indonesia	2.8	7.77	- 4.97
Vietnam	1.7	2.12	- 0.42
Singapore	0	0.31	- 0.31
Malaysia	0	2.00	- 2.00
Myanmar	0.60	0.75	- 0.15
Cambodia	0.02	0.35	- 0.32
Laos	0.08	0.83	- 0.03
Total	20.80	19.80	0.99

Source: Thai sugar millers group, 2016.

Forecast/outlook

Thailand is in a good position due to its strategic location, favourable commitments under different Free Trade Agreements, and its experience and expertise in the sugar business. According to the Thailand industrial outlook 2016 – 2018 by Krungsri Bank, the sugar industry is expected to improve gradually over the next three years, due mainly to the rebound in sugar prices and as a result of the following factors:

- **Recovery of world demand:** The demand of sugar from India (the world’s biggest sugar consuming country) is expected to increase due to economic growth. In addition, Asia is a sugar deficit region, short of 8.5 million MT a year.
- **Rise in imports:** The major consumers, especially in China and the EU, may increase imports of sugar by 10% per year after the closure of their domestic sugarcane mills. Moreover, concerns over the expected reduction in world sugar output have also induced many countries to raise sugar imports. Sugar producers and exporters could then have more bargaining power in the world market.
- **Slowdown in supply:** It is expected that the world sugar supply will gradually decrease along with the trend of declining world sugar prices during the next several years. Additionally, turbulent weather changes have discouraged the expansion of sugarcane plantation areas. It is estimated that world sugar output could decrease by an average rate of 3-5% per year.
- **Continuing ethanol production in Brazil:** The production capacity that has been kept at the same level has helped maintain demand for sugarcane which in turn results in a high sugarcane price (a cost of sugar production). This has also lessened worries over the increase of Brazil’s sugar production and exports.

5. STAKEHOLDER CONSULTATION ON SUSTAINABILITY IN SUGARCANE

Information and insight acquired through the stakeholder interviews and focus group discussions were used to identify various social and environmental opportunities and challenges in the Thai sugarcane industry at the farm, mill and market (trade) level.

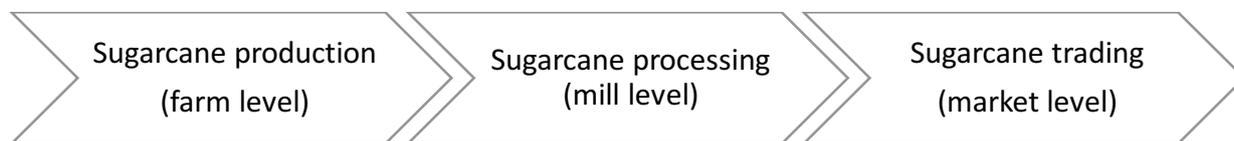


Figure 12 – Sugarcane value chain from agricultural production to processing and trading.

Outcomes from the stakeholder consultation were used to identify actions needed to move the sustainability agenda forward and to outline key elements for the design and implementation of Bonsucro improvement programmes. The findings are presented by a segment of the value chain in the following sections (Sections 5.1-3), including opportunities, challenges, and recommendations for each, and consolidated into a SWOT chart in Section 5.4 (see Figure 18). Finally, the responses were reviewed in the context of the Bonsucro Production Standard to better understand the level of readiness at the mill and farm level. A summary of the main points of discussion is provided in Section 5.5 with notes from the session included in the Appendix G.

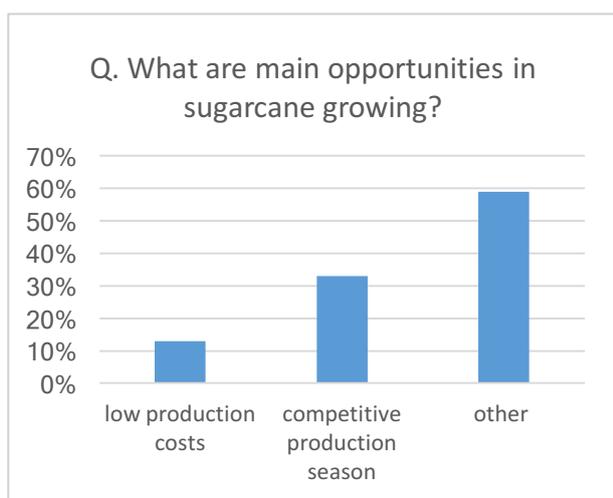
5.1 SUGARCANE PRODUCTION – FARM LEVEL

A) Opportunities

Using the information gathered for this white paper, low production costs and the competitive production season were identified as two main opportunities to growing sugarcane in Thailand.

Opportunities (or advantages) for sugarcane growers:

- **Low production costs:** The cost of sugarcane (excluding transportation) is about 1,049 THB/MT (or around 13.6 cents/lb), which is second only to Brazil’s at 11.2 cents/lb¹⁵.
- **Competitive production season:** Thailand’s sugar production season (November to April) is different from Brazil’s (April to October), which decreases competition in the export market.



When asked about the opportunities (or future advantages) for sugarcane growing in Thailand (Figure 13), around 30% of consultation participants identified the competitive production season as one the main advantages but the majority noted other aspects such as the potential expansion of sugarcane cultivation and farmer training as more significant.

Figure 6 - Opportunities for Thailand – Sugarcane growing

¹⁵ Thai Sugar Cane Industry – Krungsri Bank 2016-2018 Outlook

Among workshop participants, the consensus was that Thai sugarcane is associated with a number of positive attributes that provide farmers with a certain degree of financial security and stability. Biophysical characteristics of sugarcane, like the replanting cycle (every 3 to 5 years) and the relatively favourable growing conditions of Thailand were mentioned as the main advantages. Mill representatives also informed that they provide financial support to their farmers, usually in the form of direct loans for production inputs at the beginning of the season.

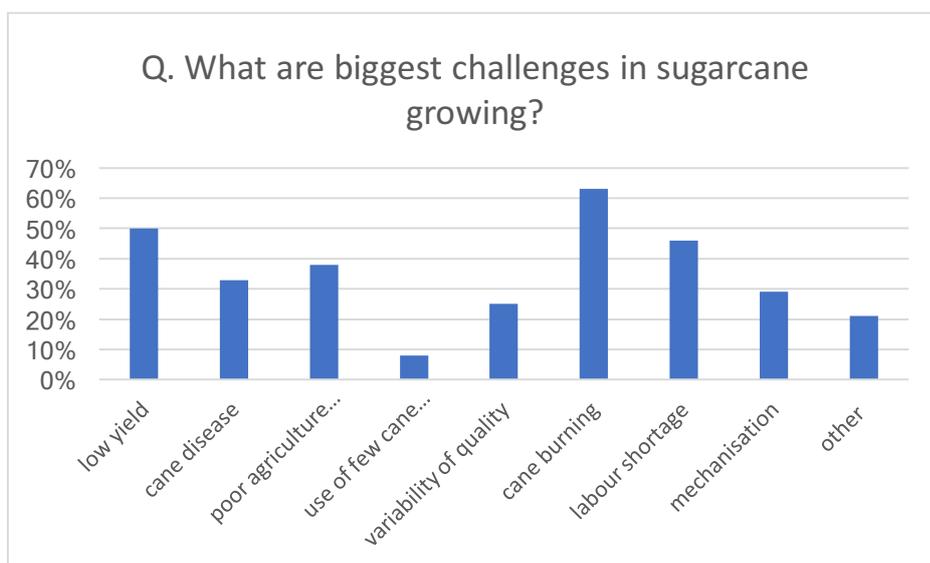
Despite the opportunities available to them, the majority of workshop participants informed that few opportunities were being fully realised. Examples like the improved use of green fertiliser and techniques like crop rotation were cited as better agricultural practices that could improve production, but they are not widely implemented. There were also opportunities to diversify, particularly in relation to sugarcane by-products because the value chain is already organised and coordinated, as well as the production of new crops like maize, tapioca etc. However, it was noted that advice and assistance from agronomists or agriculture experts would be required to do so.

B) Challenges

In relation to challenges, research indicated that there were three main issues facing farmers: low sugarcane yields, improper agriculture practices and variable sugarcane quality.

Main challenges for sugarcane growers:

- **Low sugarcane yield:** Most cane areas are rain-fed with only 10% in irrigated zones due to the relocation of cane area in the North-eastern region. Some irrigated areas are facing water supply issues - severe drought is likely to cause damage over the next 2 years.
- **Improper agriculture practices:** Cane disease is partially due to improper agriculture practices. The reliance on only a few sugarcane varieties also greatly increases the risk and spread of disease. When a new variety becomes popular, for instance, it is used extensively in that area. It is then subject to infection in a large area.
- **Variable cane quality:** Cane burning is widespread, accounting for more than 60% of cane production. The main reasons for cane burning are labour shortages and manual harvesting practices (mechanised harvesting is less than 10%). The OCSB encourages the sugarcane mills to adopt a premium price system for the freshly-cut product.



Stakeholders identified cane burning (63%) as well as low sugarcane yield (50%) and labour shortages as being the main challenges affecting sugarcane production in Thailand (Figure 14).

Figure 7 - Challenges for Thailand – Sugarcane production.

All three workshop groups emphasised the increasing costs of production, mainly in terms of labour and transportation costs, as factors that reduced profit available for reinvestment back into production (via productivity improvement or sustainability initiatives). In some cases, these costs are perpetuating bad behaviour, as illustrated with the example that farmers were continuing to load trucks over 25 tons – the legal limit - in order to save on extra transport costs. As a means to support better farm practices (or improve compliance), whether in relation to loading transport vehicles within the legal weight limits or improving cane quality such as by cutting green or reducing soil/sand contamination, one way for mills to incentivise is through “queue cutting” during harvest.

Across all the stakeholder consultation groups, the need for more farmer training to support the increased uptake of best practice was highlighted as being critical to achieving any improvements in sustainability (or otherwise). Learning from different production/management practices used in other countries was of particular interest to the mill representatives, with a recommendation to use the Bonsucro standard as the common framework to help benchmark best practice.

C) Recommendations

To maximise the potential for change with Bonsucro and/or other sustainable production programmes, farmers with sufficient area of production, access to water supply and cane growing knowledge need to be trained to implement better farming practices through modern agricultural techniques. To identify farmers ready to engage and adopt improvements, it was recommended that they are first screened using a cost-analysis or risk-based model to assess/analyse profit and loss before planting and after harvest to filter out farmers with already viable farm operations. This would not only pilot alternative solutions but also lead to success stories and a change of agendas to ensure scalability of sustainable practices and Bonsucro implementation.

To further improve industry performance, government policies should evaluate water capabilities available to provide the regions with sufficient water supplies without draining aquifer reserves. Government support should also be dedicated to developing loans or financial tools to support mechanisation, which is required from both a quality perspective as well as human resource and social aspect.

5.2 SUGARCANE PROCESSING – MILL LEVEL

A) Opportunities

The main opportunities identified for sugar production were in relation to government regulation and support measures currently in place in Thailand. They allow sugarcane producers to maintain their profitability, even during the times of depressed sugar prices in the world market, as well as market diversification of by-products that helps earn additional income.

Opportunities (or advantages) identified include:

- **Government support measures/policies:** i) restrictions of sugar mill and trader licenses, ii) control over sugar output through quota allocations (both domestic and exports), iii) fixed domestic retail prices, which are higher than world prices, allowing Thai businesses an advantage over competitors in the domestic market, and iv) establishment of a benefit sharing system between sugarcane planters and sugarcane mills (70:30), which helps stabilise factory costs.
- **Valorisation of by-products:** Sugarcane mills also earn additional income from investment in related businesses - most of which use by-products and excess materials from the sugar

industry as inputs such as ethanol, biomass electricity generation, paper pulp, fertiliser, particle board, etc.

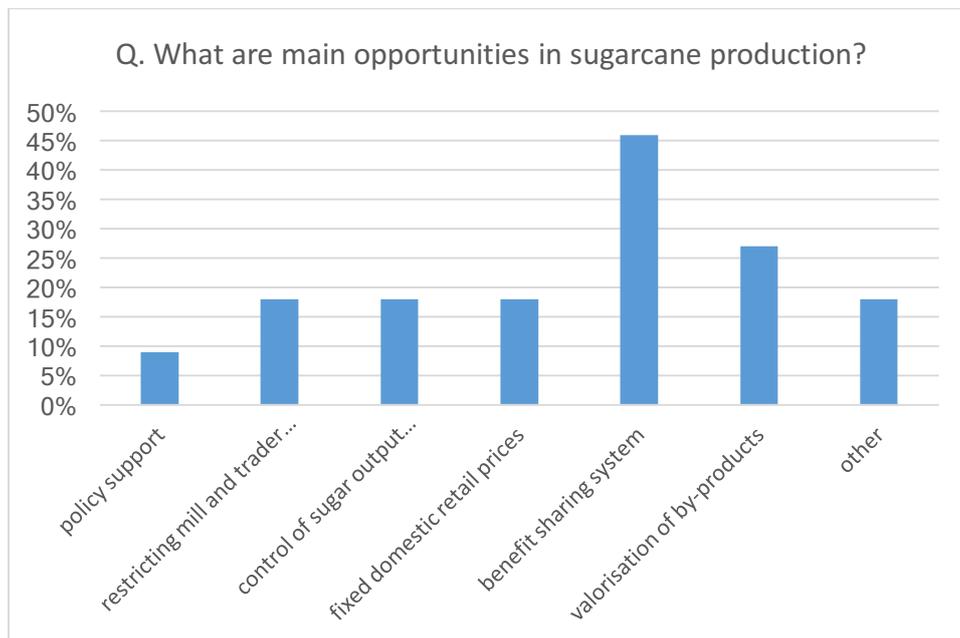


Figure 8 - Opportunities for Thailand in relation to Sugarcane production.

Participants identified the benefit sharing system between the planters and mills (46%) and diversification of sugarcane by-products (27%) as the main strengths of production at the mill level (Figure 15).

Given recent discussions at the WTO (see Section 4.2), however, these support measures will probably need to change, in which case alternative methods to support the viability of the sector need to be considered. One option to explore is the development of strategic partnerships with key stakeholders such as donors, public institutions, investors, buyers etc. under what could become Public-Private Partnerships (PPPs) to tackle production efficiency. Pilot programmes could be designed to test relevance and replicability of key partnerships and should include public support to maximise long-term governmental involvement.

B) Challenges

The main challenges for sugarcane mills:

- **High variation in output:** There is currently a wide variation in the quality of sugarcane and it is expected that this will increase in the future due to climate change issues (i.e. severe flood and drought). Ultimately, this may lead to a 10% annual decrease in output.¹⁶
- **Supply of cane:** To improve productivity, farmers need to be incentivised and trained in better production practices. However, changes in farming practice may require investment – and financial support is needed to facilitate this, especially for capital intensive investments in mechanisation, irrigation or broader technologies.
- **Environmental/climate change:** the challenges faced by sugar producers are intensified with climate change effects as well as social impacts to sugarcane farmers and communities.

¹⁶ Annual decrease as estimated by the Sugarcane Planters Association.

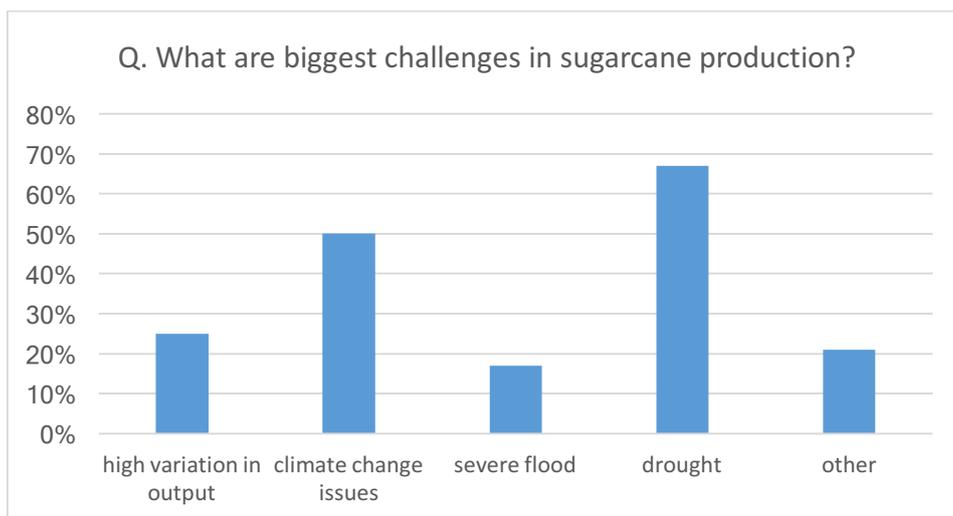


Figure 9 - Challenges for Thailand in relation to sugarcane production

Approximately half of the participants identified climate change as the biggest challenge affecting sugarcane production, with over 65% highlighting the potential impact of drought on future production as a particular challenge (Figure 16).

C) Recommendations

Farmer training and financial support for investments in mechanisation, irrigation and other technology are needed to improve the quality (and quantity) of cane supply. The mill representatives at the workshop expressed a significant interest in investing in farmers using more sustainable and modern agriculture practices where there is a clear return on investment to ensure profitability.

Targeted efforts should also be made to recruit and retain younger generations by positioning agriculture as a viable form of employment. The introduction of more modern agriculture through mechanisation and technology could be an interesting way to attract the next generation of farmers and help secure the future of agriculture in Thailand.

5.3 SUGARCANE TRADING

A) Opportunities

Opportunities identified for sugar traders:

- **Proximity to main export destinations:** The biggest advantage for the Thai sugar market lies in its proximity to Asian markets, particularly Indonesia and China, whose demands for imported sugar are increasing every year.
- **Economic Integration:** Thailand is one of the leading sugar exporters among ASEAN countries, exporting about 2.73 million MT of sugar yearly, which represents 51% of the sugar demand in this region. Further market liberalisation under the AEC is an additional opportunity for Thailand to expand its market share in the region, especially in Indonesia, which is the largest export market for sugar from Thailand.



Figure 10 - Opportunities for Thailand in relation to sugar production/trade.

Approximately 50% of the participants identified Thailand’s proximity to the main export destinations as well as the economic integration of ASEAN countries as the main advantages for Thai sugar traders (Figure 17). However, these market opportunities are based on the production and trade of sugar as a raw commodity and do not reflect possible opportunities for certified sustainable sugar. Where ‘Bonsucro certified’ sugar is traded, the price is not the only factor to be considered, as other aspects relating to sourcing risk and compliance requirements also shape the discussion.

At present, it is mainly companies with clear sustainability policies and commitments to responsible sourcing that are driving industry efforts towards environmental, social, and economic sustainability. These companies, which are usually directly linked to consumer-facing brands, take their commitment toward sustainable supply seriously, by indicating their preferences and requirements, and by finding new ways to engage with their supply chain to deliver shared value on agreed indicators (i.e. the Bonsucro standard). This means that they are able to invest in more sustainable production systems and consider additional factors beyond price when sourcing sugar.

B) Challenges

The trade in sugarcane is driven by world market price and is directly affected by price fluctuations and the price of related commodities (i.e. oil).

Main challenges for sugar traders:

- **Continued trend of low world market price:** World sugar prices are not expected to increase markedly in the short-term, possibly only to an average of 14.5-16 cents/lb. This is due to the combined effects of downward pressures from existing high sugar stockpiles, prolonged depressed oil prices, and the current sluggish speculative demand in the commodity markets.

If the price is the only factor considered when buying sugar, then the low world market price will be a significant challenge for the Thai sugarcane industry in the coming years, especially if government support measures are removed (or even reduced) in response to complaints via the WTO. For those trading in Bonsucro sugar, which provides added value for some buyers, the main challenge for traders will be to increase the volume of certified sugar. The key scalability factor lies in progressing the

sustainability dialogue with more buyers in new territories about developing sustainability commitments and greater brand support. To make that step, pilot programmes that assess the relevance, identify failures and consolidate success could be used to trial implementation of and increase supply chain support for sustainability.

C) Recommendations

Although the type and extent of future support mechanisms provided by the Thai government are unknown, at least a proportion of the current subsidies need to be redirected back into the industry in a form that does not contravene WTO conventions to help maintain the viability of the sector.

Recommended support structures include:

- farmer training programmes;
- R&D in agriculture technology; and
- loan development or other financial tools to support mechanisation and the adoption of better agricultural technologies.

5.4 SWOT FOR SUGARCANE SUSTAINABILITY

With a sense of limited natural resources on the planet, and increased climate change action and consumer awareness, Bonsucro offers a platform to invest and trade in sustainable sugar. The Bonsucro platform, supported by a metric-based standard for production as well as a chain of custody, has the potential to provide immense added value and is in line with current Thai legal and governmental frameworks regarding environmental and social aspects of sugarcane growing, production and trading as well as green energy and by-product support.

Using the challenges and opportunities identified in the preceding section, stakeholders were asked to identify specific strengths and weaknesses with respect to compliance with Bonsucro in Thailand as well as possible opportunities for improvement as well as threats to social and environmental outcomes. Figure 18 summarises some of the perceived strengths, weaknesses, opportunities and threats (S.W.O.T) and is based on the opinions expressed by stakeholders.

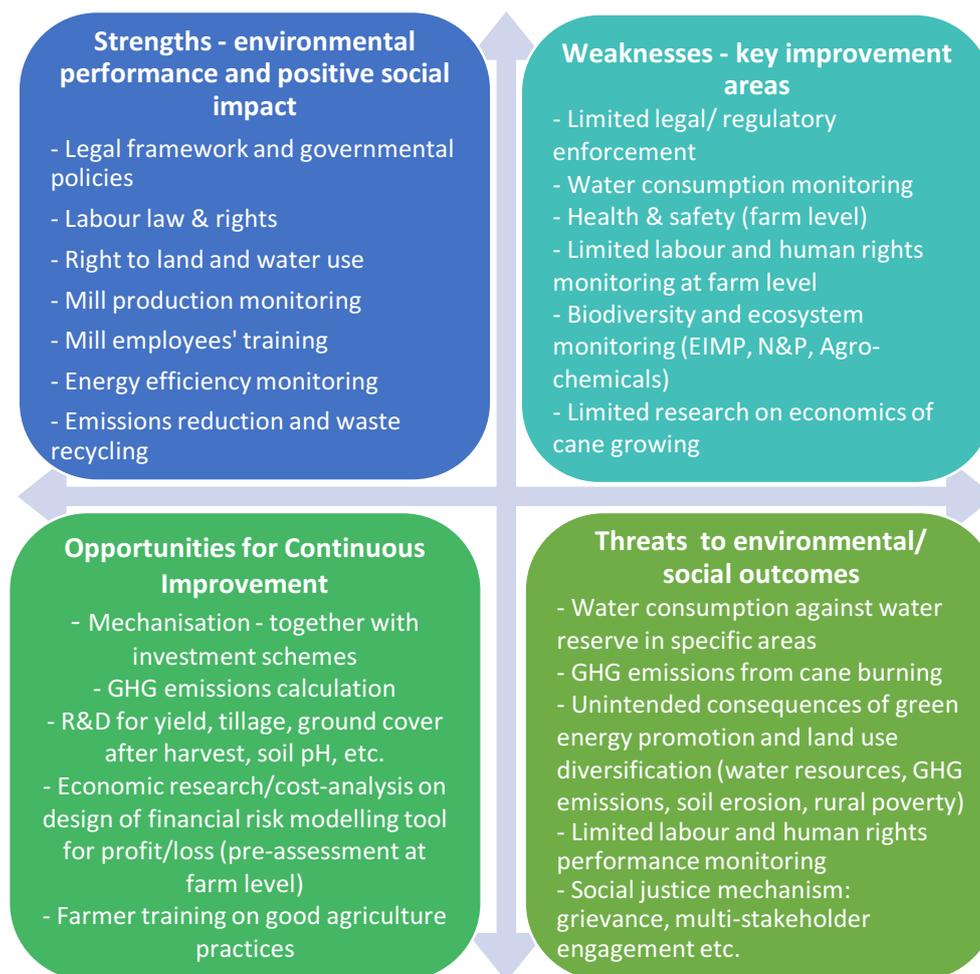


Figure 11 - Analysis of strengths, weaknesses, opportunities and threats (SWOT) for Thai sugarcane and compliance with the Bonsucro standard.

5.5 OPPORTUNITIES AND CHALLENGES IN THE CONTEXT OF THE BONSUCCRO

Using the Bonsucro standard as a framework, opportunities and challenges identified by participants in the Bonsucro Technical Week Workshop were discussed in the context of the standard's principles. Where 'opportunities' were assigned, the group discussed whether it indicated a level of awareness or readiness of compliance. Where 'challenges' were assigned, there was a discussion about whether this indicated limited/low readiness or an indication of compliance concerns. Below is a summary of the main points of discussion.

Principle 1 – obey the law

The discussion under Principle 1 focussed on the demonstration of title to land and water as there was significant concern expressed in the group that the majority of smallholders, as well as most contract farmers, would find it difficult to provide evidence of compliance. As explained, in Thailand, there are different kinds of land titles (like rice ownership certification or permits) and these are associated with different land use rights, which specify the type of activity and area. About 70 to 80% of the land is rented by farmers from an agent or someone they trust – usually through a verbal contract and often through a long-term arrangement. However, the legal system is not favourable regarding rights transfer especially for farmers (even if they have used the land for generations)

because they need official documentation to do so. This means that the family may inherit the land but cannot sell it.

With respect to water use and access, permits are required to dig for artesian wells. Even though farmers are aware of this requirement, these permits are not always obtained, particularly in situations where proof of land title/use rights is lacking. Mills are concerned that if they require farmers to get water permits as part of the certification process, the farmers may be subject to retroactive fines and other penalties which could destroy their relationship and co-operation and/or engagement with the implementation of the standard.

Workshop participants recommended that Bonsucro review these indicators in the context of Thailand and consider the real intent of the indicators; that is, to what extent is there a risk or conflict over ownership or land/water use? It was suggested that Bonsucro adapt the indicators to state that land should not be acquired through illegal means or from reserved land, for example. An alternative would be to provide clear auditor guidance on this issue so that the intention behind the indicator is what is being assessed.

Principle 2 – respecting labour rights/human rights

The discussion under Principle 2 focussed on the importance of investment capability as a means to improve working conditions. Investment was needed to support better enforcement and to create conditions that fostered better working environments. For example, in terms of child labour, the group felt strongly that while this was not a problem at the mills – and that there was a high level of awareness about both child and forced labour. They accepted that for smallholder farms, it was likely that all family members were engaged to some extent in farm activities so the challenge was, therefore, to improve awareness of the types and extent of acceptable activities and then how to address (and compensate for) the potential loss of labour.

Another way to facilitate compliance was by investing in technology or equipment that contributes to better/safer working conditions. Investment in mechanisation at the farm level, for example, reduces labour requirements and more specifically, the use of labour in cane cutting which is potentially hazardous. Another example provided was the use of PPE. At the mill level, the level of PPE use by employees was high because it was provided, and use enforced, by the mills. Use of PPE at the farms was much more of a problem, especially where it was not being provided by the farms.

Principle 3 – managing input, production and processing efficiencies

Workshop participants were clear that investment capital was needed to improve efficiencies in mills and farms but the focus of the discussion was on farms as better-quality sugarcane was identified as critical to both. To improve, farmers needed greater access to free and more consistent farmer training programmes designed around improving agriculture practices and data collection methods. It was felt that this knowledge would ultimately help to increase yields and productivity via feedback loops, the assumption being that if farmers could monitor relevant indicators (e.g. quality, inputs, productivity etc.), they could then make decisions based on the results and manage production more efficiently.

Principle 4 – actively managing biodiversity and ecosystem services

When reviewing principle 4, participants related the issue of biodiversity mainly to the agro-chemicals being applied to the field (per hectare and per year). They cited the use of alternatives (e.g. green fertilizers) and crop rotation as practices that could lead to more efficient soil management, resulting in greater optimisation of any applied agro-chemicals, including N, P & K fertilizer. Although there was a good degree of general knowledge in the room about this issue, in practice, specialised technical support in the form of local agronomists, for example, would be required to help farms adapt to local conditions to ensure successful implementation.

Principle 5 – continuously improving key areas of the business

Discussions relating to principle 5 centered around key areas identified during technical week which included: water management, mechanisation of harvest, sugarcane quality and social compliance. To foster continuous improvement efforts, workshop participants stated that loan development or other financial/ technology tools had to be expanded and made more accessible to farmers. They also reiterated the need for free and more consistent training programmes to build capacity.

The rest of the discussion focussed on water and more specifically, how to address management on a wider scale given the increasing pressure on water resources. Participants were largely aware that water use had to be reduced in irrigated areas to conserve water and to avoid draining aquifers. To address the wider issues of water management, however, better systems needed to be used across Thailand, starting with an evaluation of water availability in line with regional water suppliers and use of clear indicators that measure efficiency.

Principle 6 – Additional mandatory requirements for biofuels under the EU Renewable Energy Directive and revised Fuel Quality Directive¹⁷

Under principle 6, the group discussed cane burning and its relative impact on climate change and other factors of production such as soil quality. It was suggested that burning could lead to lower yields and higher costs of production but if it was reduced (or eliminated), it would result in a reduction of GHG emissions and also improved soil management, which is crucial to sustaining a high biodiversity value. At the field level, mechanised harvesting would effectively reduce the demand for burning in Thailand as long as the equipment was appropriate for smallholder farms and local conditions.

Workshop participants concluded that it would be very difficult to stop burning in Thailand unless a ban (or restriction) was supported by government regulation and then enforced accordingly. If managed on a voluntary basis, the group questioned the speed at which a change would occur and whether enough farmers would ever stop burning cane - even if better access to appropriate machinery was provided. It was therefore recommended that all options to stop cane burning are fully explored, including the need for financial and expert knowledge support.

¹⁷ EU Renewable Energy Directive – 2009/28/EC and Fuel Quality Directive - 2009/30/EC.

6. CONCLUSIONS AND RECOMMENDATIONS

This report was written to inspire action, co-operation, and transparency among stakeholders wishing to improve economic, environmental and social sustainability in the sugarcane industry in Thailand. As part of the consultation process, stakeholders identified some of the social, economic, and environmental challenges in the Thai sugarcane industry, as well as key opportunities to drive the sustainability agenda forward. The Bonsucro performance framework was identified as a logical framework to measure these sustainability indicators and through its collaborative platform, as a means to facilitate a comprehensive value chain approach that allows growers, producers and buyers to use comparable metrics and tools to measure and monitor performance.

Actions identified by stakeholders as having the potential to positively affect the sugarcane sector in Thailand included:

- ✓ Mechanisation of harvest
- ✓ Dedicated investment schemes for improvement
- ✓ Environmental monitoring and management
- ✓ Increased economic research and financial risk modelling
- ✓ Farmer training in good agriculture practices and data collection

In order to implement these improvements and maximise impact, capacity building programmes are needed to build industry knowledge and financial support mechanisms put in place to enable investment. The development of a new set of innovative incentives directed towards farmers and millers to reduce the environmental footprint of sugarcane is also needed to support mechanisation, irrigation and/or the adoption of other technologies to drive improved quality and productivity.

Improved stakeholder engagement: government and farmers

To address some of the biggest challenges in the sugarcane industry, improved stakeholder engagement and collaboration is needed across the supply chain, and with the Government of Thailand and farmers in particular. In relation to the Government, stakeholders informed that greater policy and technical support was needed in the following areas:

- ✓ Evaluating water quantity use and permitting capacity to provide sufficient water supplies without draining aquifer reserves.;
- ✓ Supporting financial mechanisms for investments;
- ✓ Implementing monitoring mechanisms from both product quality perspective as well as human resource and social aspects; and
- ✓ Restricting/banning the burning of cane, with financial support for mechanisation provided.

The importance of engaging with farmers was also highlighted as a priority issue, with the ultimate aim to improve quality and production on the farm. To achieve these aims, farmers have to adopt new, more sustainable practices – something they are often slow in doing because of the potential risk involved, limited technical knowledge or ability to invest in required inputs. It was suggested that a pilot or test group of farmers trial new approaches while collecting data to demonstrate outcomes and impacts to their peers along the way. Any lessons learned with the farmer group could then be used to scale the adoption of sustainable practices along with other Bonsucro improvement programmes.

7. REFERENCES

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8. APPENDICES

APPENDIX A: QUESTIONNAIRE – ENGLISH & THAI VERSIONS

<p>1. Sugar cane sector can be organised in 3 type of activities: growing, production/transformation or trade; which group do you think you represent?</p> <p><input type="radio"/> Growing cane</p> <p><input type="radio"/> Sugar production or Ethanol production</p> <p><input type="radio"/> Trade of sugar or ethanol</p>	<p>1. ภาคอุตสาหกรรมอ้อยสามารถแบ่งเป็น 3 ชั้นตอนได้คือ การปลูก การผลิต/การแปรรูป หรือการค้า คุณคิดว่าคุณอยู่ในภาคส่วนใด</p> <p><input type="radio"/> การปลูกอ้อย</p> <p><input type="radio"/> การผลิตน้ำตาลหรือเอทานอล</p> <p><input type="radio"/> การค้าน้ำตาลหรือเอทานอล</p>
<p>2. Cane growing activities: The majority of sugar mills in Thailand don't grow their own cane. Only a few have their own sugar plantation. The sugar mills establish contract-farming with the sugarcane growers and provides them pre-season credit.</p> <p>The majority of sugarcane growers is still small and medium farm[1]. Their production capacity is about 1000 to 2000 MT. Only 17% of them is considered large with the annual production more than 2,000 MT</p> <p>In general, the sugar mills signed the contract with the sugarcane grower's leader or quota head, which is often a sugarcane grower with a large cane area</p> <p>The cane area covers 47 provinces, which is divided in 93% of the plantation for the sugar mill and 7% for the plantation for the seedling. Sugarcane growing represents about 8% of total agricultural land of Thailand</p> <p>The sugarcane production in 2017 is forecasted about 91.05 million MT or 9.1 to 9.2 million MT of sugar, a drop of 3 million MT from the previous year due to drought early in the growing season and excessive rain during the harvest season.</p> <p><input type="radio"/> No comments</p> <p>Comment</p> <input type="text"/>	<p>2. เรื่องการปลูกอ้อย โรงงานน้ำตาลอ้อยส่วนใหญ่ในประเทศไทยไม่ได้ปลูกอ้อยเอง มีเพียงไม่กี่โรงงานเท่านั้นที่มีโรงงานเป็นของตัวเอง โรงงานน้ำตาลอ้อยจึงทำสัญญากับผู้ปลูกอ้อยและให้สินเชื่อกับผู้ปลูกอ้อยก่อนถึงฤดูกาล</p> <p>ผู้ปลูกอ้อยส่วนใหญ่ยังคงเป็นฟาร์มขนาดเล็กและขนาดกลาง กำลังการผลิตมีประมาณ 1,000 ถึง 2,000 เมตริกตัน มีเพียงร้อยละ 17 ของผู้ปลูกอ้อยเท่านั้นที่เป็นขนาดใหญ่และมีกำลังการผลิตต่อปีมากกว่า 2,000 เมตริกตัน</p> <p>ปกติแล้ว โรงงานผลิตอ้อยจะเซ็นสัญญากับหัวหน้าของชาวไร่ หรือเซ็นเป็นสัญญาโควตาต่อหัวซึ่งมักจะเซ็นกับผู้ปลูกอ้อยที่มีพื้นที่ปลูกอ้อยขนาดใหญ่</p> <p>พื้นที่ไร้อ้อยครอบคลุมพื้นที่ 47 จังหวัดซึ่งจะแบ่งเป็นร้อยละ 93 ที่เป็นไร่ปลูกน้ำตาลอ้อยและอีกร้อยละ 7 ที่เป็นไร่เพาะพันธุ์ การปลูกน้ำตาลอ้อยคิดเป็นพื้นที่ทางการเกษตรของประเทศไทยทั้งหมดร้อยละ 8</p> <p>ในปีค.ศ. 2017 คาดการณ์ว่าจะผลิตน้ำตาลอ้อยได้ประมาณ 91.05 ล้านเมตริกตันหรือคิดเป็นน้ำตาล 9.1 ถึง 9.2 ล้านเมตริกตัน ลดลง 3 ล้านเมตริกตันจากปีก่อนเพราะมีภัยแล้งในช่วงฤดูเพาะปลูกและมีฝนที่ตกมากเกินไปในช่วงฤดูเก็บเกี่ยว</p> <p><input type="radio"/> ไม่มีข้อคิดเห็น</p> <p>แสดงความเห็นเกี่ยวกับเรื่องนี้</p> <input type="text"/>
<p>3. In your opinion, in relation to the Sugarcane growing, what are the opportunities for Thailand?</p> <p><input type="checkbox"/> Low production costs</p> <p><input type="checkbox"/> Competitive production season</p> <p><input type="checkbox"/> Other (please specify)</p>	<p>3. คุณคิดว่า ประเทศไทยมีข้อได้เปรียบใดในแง่ของการปลูกน้ำตาลอ้อย</p> <p><input type="checkbox"/> ต้นทุนการผลิตที่ต่ำลง</p> <p><input type="checkbox"/> ฤดูการผลิตที่มีการแข่งขันสูง</p> <p><input type="checkbox"/> อื่น ๆ (โปรดระบุ)</p>
<p>4. In your opinion, in relation to the Sugarcane growing, what are the challenges for Thailand?</p> <p><input type="checkbox"/> Low sugarcane yield</p> <p><input type="checkbox"/> Cane disease</p> <p><input type="checkbox"/> Improper culture practices</p> <p><input type="checkbox"/> Use of few sugarcane varieties</p> <p><input type="checkbox"/> Variability of cane quality</p> <p><input type="checkbox"/> Cane burning</p> <p><input type="checkbox"/> Labor shortage</p> <p><input type="checkbox"/> Mechanization</p> <p><input type="checkbox"/> Other (please specify)</p>	<p>4. คุณคิดว่าประเทศไทยประสบปัญหาเรื่องอะไรในแง่ของการปลูกน้ำตาลอ้อย</p> <p><input type="checkbox"/> ผลผลิตน้ำตาลอ้อยที่ตกต่ำ</p> <p><input type="checkbox"/> โรคที่มากับต้นอ้อย</p> <p><input type="checkbox"/> การเพาะปลูกที่ไม่เหมาะสม</p> <p><input type="checkbox"/> การใช้น้ำตาลอ้อยที่ไม่หลากหลาย</p> <p><input type="checkbox"/> ความแตกต่างของคุณภาพของอ้อย</p> <p><input type="checkbox"/> การเผาอ้อย</p> <p><input type="checkbox"/> การขาดแคลนแรงงาน</p> <p><input type="checkbox"/> การใช้เครื่องจักร</p> <p><input type="checkbox"/> อื่น ๆ (โปรดระบุ)</p>

<p>5. Cane production activities (mill): The majority of sugarcane production in Thailand is for sugar production; only a few amounts is used for the ethanol production. The crushing report of OCSB indicated that the extraction rate is between 100 to 108 kg of sugar per MT of cane with an average of 104.73 kg of sugar per MT of cane. The extract rate of 20016 is 104.05 kg of sugar per MT of cane, which is declined approximately 3% compared to 2015 due to weather conditions.</p> <p>There are 51 plants registered by the OCSB in 2015, which belong to 22 companies. There are 4 new plants established in 2016. These sugar mills are located separately in 27 provinces with a total of around 50,000 workers.</p> <p>Under the 10-year Cane and Sugar Strategy (2015 – 2026), Thai government approved the construction of 13 new sugar mills in 2016 and allowed the expansion of 6 existing sugar mills, which expected to increase an additional production capacity. This action is expected to achieve the production capacity of at least 1.1 million MT of sugarcane daily.</p> <p>Major sugar processors in Thailand are Mitrphol Group, Thai Roong Ruang group, Thai Ekalek Group (KTIS) and Tamaka Group (KSL), and Wang Kanai Group. Together they have more than 80% of the market share of sugar sold in the domestic market under the Quota A allocation^[1]. Mitrphol and Thai Roong Ruang groups shares 20% and 14% of total production capacity of sugar in the country. Both are world's major exporters of sugar. In 2015, Mitrphol Group and Thai Roong Ruang Group ranked the 3rd and the 4th position of sugar exporters in the world market (World Top Export, 2016)</p> <p>[1] white sugar for domestic consumption only</p> <p><input type="radio"/> No comments</p> <p>Comment</p> <input type="text"/>	<p>5. เรื่องโรงงานการผลิตอ้อย การผลิตอ้อยส่วนใหญ่ในประเทศไทยเป็นการผลิตน้ำตาล มีการใช้เพื่อผลิตเอทานอลซึ่งไม่มากนัก มีรายงานของสำนักงานคณะกรรมการอ้อยและน้ำตาลทรายระบุว่ามียอดการสกัดน้ำตาลอยู่ที่ 100 ถึง 108 กิโลกรัมต่อเมตริกตัน โดยเฉลี่ยเป็นน้ำตาล 104.73 กิโลกรัมต่อเมตริกตัน อัตราการสกัด ในปี.ศ. 2016 เป็นน้ำตาล 104.05 กิโลกรัมต่อเมตริกตัน ซึ่งลดลงประมาณร้อยละ 3 เมื่อเทียบกับปี.ศ. 2015 เนื่องจากสภาพอากาศที่ไม่เอื้ออำนวย</p> <p>ในปี.ศ. 2015 มีโรงงานที่สำนักงานคณะกรรมการอ้อยและน้ำตาลทรายลงทะเบียนอยู่ 51 โรงงานซึ่งมีบริษัท 22 แห่ง และในปี.ศ. 2016 มีบริษัท ใหม่ก่อตั้งขึ้นอีก 4 แห่ง โรงงานน้ำตาลเหล่านี้ตั้งอยู่ห่างกันในพื้นที่ 27 จังหวัดซึ่งมีคนงานทั้งหมด 50,000 คน</p> <p>กลยุทธ์ในช่วง 10 ปี (ปี.ศ. 2015-2026) รัฐบาลอนุมัติการสร้างโรงงานน้ำตาล ใหม่ทั้งหมด 13 แห่ง ในปี.ศ. 2016 และยอมให้มีการขยายตัวของโรงงานน้ำตาล 6 แห่งที่มีอยู่แล้วซึ่งคาดว่าจะเพิ่มกำลังการผลิตด้วย มาตราการน้ำตาลว่าจะทำให้มีอัตราการผลิตน้ำตาลอ้อยอย่างน้อย 1.1 ล้านเมตริกตัน</p> <p>บริษัทแปรรูปน้ำตาลบริษัทหลัก ในประเทศไทยคือ กลุ่มมิตรผล กลุ่มไทยรุ่งเรือง กลุ่มไทยเอกสิทธิ์ (KTIS) และกลุ่มท่ามะกา (KSL) และกลุ่มวิชัยชัย ทั้งหมดนี้มีส่วนแบ่งทางการตลาดน้ำตาลของตลาดในประเทศมากกว่าร้อยละ 60 ภายใต้กฎการแบ่งสรรโควตาประเภท ก [1]กลุ่มมิตรผลและไทยรุ่งเรืองมีส่วนแบ่งร้อยละ 20 และ 14 ของกำลังการผลิตน้ำตาลทั้งหมดในประเทศ ทั้งสองกลุ่มนี้เป็นผู้ส่งออกน้ำตาลรายหลักของโลก ในปี.ศ. 2015 กลุ่มมิตรผลและกลุ่มไทยรุ่งเรืองขึ้นเป็นอันดับที่ 3 และ 4 ของผู้ส่งออกน้ำตาลในตลาดโลก (ตามข้อมูลของ World Top Export ในปี.ศ. 2016)</p> <p>[1] น้ำตาลขาวภายในประเทศเท่านั้น</p> <p><input type="radio"/> ไม่มีข้อคิดเห็น</p> <p>ได้ข้อคิดเห็น</p> <input type="text"/>
<p>6. In your opinion, in relation to the Sugarcane production, what are the opportunities for Thailand?</p> <p><input type="checkbox"/> Policy support and measures to maintain profitability</p> <p><input type="checkbox"/> Restriction of sugar mill and trader license</p> <p><input type="checkbox"/> Control over sugar output by the quotas allocations for domestic consumption and for exports</p> <p><input type="checkbox"/> Fixed domestic retail prices,</p> <p><input type="checkbox"/> Establishment of benefit sharing system between sugarcane planters and sugar mills (70:30)</p> <p><input type="checkbox"/> Valorization of by-products such as ethanol, biomass electricity generation, paper pulp, fertilizer, particle board, etc.</p> <p><input type="checkbox"/> Other (please specify)</p>	<p>6. คุณคิดว่าประเทศมีข้อได้เปรียบใด ในแง่ของการผลิตน้ำตาลอ้อย</p> <p><input type="checkbox"/> การสนับสนุนนโยบายและมาตรฐานเพื่อรักษาการทำกำไร</p> <p><input type="checkbox"/> การจำกัดใบอนุญาตโรงงานน้ำตาลและผู้ค้า</p> <p><input type="checkbox"/> การควบคุมผลผลิตน้ำตาลโดยใช้การแบ่งสรรตามโควตาสำหรับการบริโภคภายในประเทศและการส่งออก</p> <p><input type="checkbox"/> ราคาปลีกในประเทศไทยที่คงตัว</p> <p><input type="checkbox"/> (70:30) สร้างระบบการแบ่งผลกำไรระหว่างผู้ปลูกน้ำตาลอ้อยและโรงงานผลิตน้ำตาล (70:30)</p> <p><input type="checkbox"/> การกำหนดราคาส่งออกได้ เช่น เอทานอล การผลิตกระแสไฟฟ้าโดยใช้ไบโอมแอส เอ็กเซลเลอร์ บั๊ก แพนท์จากเออีอ้อย เป็นต้น</p> <p><input type="checkbox"/> อื่น ๆ (โปรดระบุ)</p>
<p>7. In your opinion, in relation to the Sugarcane production, what are the challenges for Thailand?</p> <p><input type="checkbox"/> High variation in output</p> <p><input type="checkbox"/> Climate change issues</p> <p><input type="checkbox"/> Severe flood</p> <p><input type="checkbox"/> Drought</p> <p><input type="checkbox"/> Other (please specify)</p>	<p>7. คุณคิดว่าอะไรคือปัญหาเกี่ยวกับเรื่องการผลิตน้ำตาลอ้อยในประเทศไทย</p> <p><input type="checkbox"/> มีความแตกต่างในเรื่องผลผลิตสูง</p> <p><input type="checkbox"/> ปัญหาเรื่องการเปลี่ยนแปลงสภาพอากาศ</p> <p><input type="checkbox"/> ปัญหาน้ำท่วมที่รุนแรง</p> <p><input type="checkbox"/> ปัญหาภัยแล้ง</p> <p><input type="checkbox"/> อื่น ๆ (โปรดระบุ)</p>
<p>8. Sugar cane trade activities:</p> <p>For domestic market, the quota for the sugar for the domestic consumption falls into the A category, while sugar for domestic consumption only and is organised by governmental policy.</p> <p>For Export, Thailand remains a major sugar producer and the world's second-largest exporter, trailing only Brazil. Sugar exports increased from 7.57 million MT in 2014 to 8.27 million MT in 2015, rising by 9.24% (mostly in the form of raw sugar exports). More than 90% of Thailand's sugar exports are sold in the Asian countries, where Thailand has advantage over transportation costs under the AFTA Agreement effective; sugar imports will be duty free in most ASEAN countries, except for the Philippines (5%), Indonesia (5 to 10%), and Myanmar (0 to 5%). This makes Thai sugar cheaper than non-ASEAN suppliers.</p> <p><input type="radio"/> No comments</p> <p>Comment</p> <input type="text"/>	<p>8. เรื่องการค้าน้ำตาลอ้อย สำหรับตลาดภายในประเทศ โควตาน้ำตาลเพื่อการบริโภคภายในประเทศอยู่ในประเภท ก. ส่วนน้ำตาลขาวเพื่อการบริโภคภายในประเทศจะได้รับจัดการโดยนโยบายรัฐ</p> <p>สำหรับการส่งออก ประเทศไทยยังคงเป็นผู้ผลิตน้ำตาลรายหลักและเป็นผู้ส่งออกรายใหญ่ที่สุดของโลกเป็นอันดับที่สอง เป็นรองเพียงประเทศบราซิล ยอดส่งออกน้ำตาลเพิ่มขึ้นจาก 7.57 ล้านเมตริกตัน ในปี.ศ. 2014 เป็น 8.27 ล้านเมตริกตัน ในปี.ศ. 2015 เพิ่มขึ้นร้อยละ 9.24 (ส่วนใหญ่เป็นการส่งออกน้ำตาลดิบ) ยอดส่งออกของไทยมากกว่าร้อยละ 90 ขายในทวีปเอเชีย ซึ่งประเทศไทยมีข้อได้เปรียบด้านค่าขนส่งภายใต้ข้อตกลง AFTA นั่นก็คือ การนำเข้าน้ำตาลจะปลอดภาษีในประเทศอาเซียน ยกเว้นประเทศฟิลิปปินส์ (คิดภาษีร้อยละ 5) อินโดนีเซีย (ร้อยละ 5 ถึง 10) และพม่า (ร้อยละ 0 ถึง 5) ซึ่งทำให้น้ำตาลจากประเทศไทยราคาถูกกว่าผู้ส่งออกน้ำตาลที่ไม่ใช่อาเซียน</p> <p><input type="radio"/> ไม่มีข้อคิดเห็น</p> <p>แสดงข้อคิดเห็น</p> <input type="text"/>
<p>9. In your opinion, in relation to the Sugarcane trade, what are the opportunities for Thailand?</p> <p><input type="checkbox"/> Proximity of the main export destination (Asian markets)</p> <p><input type="checkbox"/> Economic Integrations:</p> <p><input type="checkbox"/> Market price fluctuation</p> <p><input type="checkbox"/> Other (please specify)</p>	<p>9. คุณคิดว่าประเทศไทยมีข้อได้เปรียบใดจากการค้าน้ำตาลอ้อย</p> <p><input type="checkbox"/> ความใกล้ชิดกับประเทศที่ส่งออกไป (ตลาดอาเซียน)</p> <p><input type="checkbox"/> การรวมเศรษฐกิจ</p> <p><input type="checkbox"/> ราคาส่งออกที่ผันผวน</p> <p><input type="checkbox"/> อื่น ๆ (โปรดระบุ)</p>

<p>10. In your opinion, in relation to the Sugarcane trade, what are the challenges for Thailand?</p> <ul style="list-style-type: none"> <input type="checkbox"/> Market price fluctuation <input type="checkbox"/> Decrease of world sugar stockpiles <input type="checkbox"/> Upside move of prices <input type="checkbox"/> Sluggish speculative demand in the commodity markets <input type="checkbox"/> Other (please specify) 	<p>10. คุณคิดว่าประเทศไทยประสบปัญหาใดเกี่ยวกับภาวะน้ำตาลอ้อย</p> <ul style="list-style-type: none"> <input type="checkbox"/> ราคาตลาดที่ผันผวน <input type="checkbox"/> น้ำตาลสำรองที่ลดลงของโลก <input type="checkbox"/> การเพิ่มราคา <input type="checkbox"/> อุปสงค์ที่ฟุ้งซ่านในตลาดสินค้า <input type="checkbox"/> อื่น ๆ (โปรดระบุ)
<p>11. Looking at human rights performance in the sugar cane in Thailand, how much will you agree with the following?</p> <ul style="list-style-type: none"> <input type="checkbox"/> The sugarcane planter associations encourage and support all sugar mills to prevent child labor and forced labor through the industry's supply chains. <input type="checkbox"/> Every sugar mill bans child labor and all forms of illegal labor and rejects buying cane produced by child labor and forced labor. <input type="checkbox"/> All sugar mills in the country comply with labor laws and international labor standards. <p>Other (please specify)</p> <input type="text"/>	<p>11. หากพิจารณาเรื่องการดำเนินงานสิทธิมนุษยชน ในส่วนของการผลิตน้ำตาลอ้อย ในประเทศไทย คุณเห็นด้วยกับข้อความต่อไปนี้มากเพียงใด</p> <ul style="list-style-type: none"> <input type="checkbox"/> สมาคมผู้ปลูกน้ำตาลอ้อยส่งเสริมและสนับสนุนโรงงานผลิตน้ำตาลทุกแห่ง ให้เป็นอันจกเลิกใช้แรงงานเด็กและไม่ให้ใช้แรงงานที่ถูบังคับผ่านห่วงโซ่อุปทานของอุตสาหกรรมนี้ <input type="checkbox"/> โรงงานผลิตน้ำตาลทุกแห่งเคารพ ใช้แรงงานตามกฎหมายการใช้แรงงานเด็กกฎหมายคุ้มครองแรงงานที่ละเอียดโดยแรงงานเด็กและแรงงานที่ถูบังคับ <input type="checkbox"/> โรงงานผลิตน้ำตาลทุกแห่งในประเทศไทยปฏิบัติตามกฎหมายที่บังคับใช้แรงงานและกำหนดมาตรฐานสากลที่บังคับใช้แรงงานเด็ก <p>อื่น ๆ (โปรดระบุ)</p> <input type="text"/>
<p>12. Looking at Health and Safety performance in Sugar cane in Thailand, how much will you agree with the following?</p> <ul style="list-style-type: none"> <input type="checkbox"/> Farm provide a safe and healthy working environment in work place operations <input type="checkbox"/> Feed mills provide a safe and healthy working environment in work place operations <input type="checkbox"/> Main health and safety risks are assessed and measures for mitigation of risk are implemented <input type="checkbox"/> Appropriate personal protective equipment supplied to and used by all worker <input type="checkbox"/> staff trained for health and safety <input type="checkbox"/> Access to drinking water in sufficient quantity <input type="checkbox"/> Access to first aid and provision for emergency response <p>Other (please specify)</p> <input type="text"/>	<p>12. หากพิจารณาเรื่องการดำเนินงานสุขภาพและความปลอดภัย ในส่วนของการผลิตน้ำตาลอ้อย ในประเทศไทย คุณเห็นด้วยกับข้อความต่อไปนี้มากเพียงใด</p> <ul style="list-style-type: none"> <input type="checkbox"/> ฟาร์มทำให้มีสภาพแวดล้อมการทำงานที่ปลอดภัยและไม่เป็นอันตรายต่อสุขภาพ ในพื้นที่ปฏิบัติงาน <input type="checkbox"/> โรงงานผลิตจัดให้มีสภาพแวดล้อมในการทำงานที่ปลอดภัยและไม่เป็นอันตรายต่อสุขภาพ ในพื้นที่ปฏิบัติงาน <input type="checkbox"/> มีการประเมินความเสี่ยงหลัก ในเชิงสุขภาพและความปลอดภัยและมีการใช้มาตรฐานเพื่อลดความเสี่ยง <input type="checkbox"/> มีอุปกรณ์ป้องกันของแรงงานแต่ละคนที่เหมาะสมและแรงงานทุกคนได้ใช้งาน <input type="checkbox"/> บุคลากรผ่านการฝึกอบรมเพื่อความปลอดภัยและสุขภาพ <input type="checkbox"/> มีน้ำดื่มในปริมาณที่พอใช้ <input type="checkbox"/> มีการปฐมพยาบาลและความช่วยเหลือ ในกรณีเกิดอุบัติเหตุฉุกเฉิน <p>อื่น ๆ (โปรดระบุ)</p> <input type="text"/>
<p>13. Looking at labor conditions in Sugar cane in Thailand, how much will you agree with the following?</p> <ul style="list-style-type: none"> <input type="checkbox"/> Minimum wage and benefits required by law <input type="checkbox"/> Maximum number of hours worked <input type="checkbox"/> Overtime is paid <input type="checkbox"/> Payment for cane deliveries are made according to agreed <input type="checkbox"/> Existence of a contract <p>Other (please specify)</p> <input type="text"/>	<p>13. หากพิจารณาเรื่องสภาพชีวิตของแรงงาน ในส่วนของการผลิตน้ำตาลอ้อย ในประเทศไทย คุณเห็นด้วยกับข้อความต่อไปนี้มากเพียงใด</p> <ul style="list-style-type: none"> <input type="checkbox"/> มีค่าจ้างขั้นต่ำและผลประโยชน์ตามที่กฎหมายกำหนด <input type="checkbox"/> มีการกำหนดชั่วโมงการทำงานสูงสุด <input type="checkbox"/> มีการจ่ายค่าล่วงเวลา <input type="checkbox"/> มีการจ่ายค่าส่งมอบตามที่กำหนดไว้ <input type="checkbox"/> มีสัญญา <p>อื่น ๆ (โปรดระบุ)</p> <input type="text"/>
<p>14. Looking at production monitoring and process efficiency in Sugar cane in Thailand, how will you assess the following capacities?</p> <ul style="list-style-type: none"> <input type="checkbox"/> Total raw materials used per kg product <input type="checkbox"/> 2 Yield of production <input type="checkbox"/> Mill overall time <input type="checkbox"/> Factory Performance Index <input type="checkbox"/> Industrial Efficiency <input type="checkbox"/> Net GHG emissions per tonne of cane <input type="checkbox"/> Net GHG emissions per tonne of sugar <input type="checkbox"/> Net GHG emissions per MJ of ethanol <p>Other (please specify)</p> <input type="text"/>	<p>15. หากพิจารณาเรื่องการควบคุมผลิตภัณฑ์และประสิทธิภาพของขั้นตอนการผลิตน้ำตาลอ้อย ในประเทศไทย คุณเห็นด้วยกับข้อความต่อไปนี้มากเพียงใด</p> <ul style="list-style-type: none"> <input type="checkbox"/> วัสดุต้นทางที่ได้เป็นต้นฉบับ <input type="checkbox"/> ผลจากการผลิตได้เป็น 2 ผลิตภัณฑ์ <input type="checkbox"/> เวลาทั้งหมดในการผลิต <input type="checkbox"/> ประสิทธิภาพของโรงงาน <input type="checkbox"/> ประสิทธิภาพทางอุตสาหกรรม <input type="checkbox"/> การปล่อยก๊าซเรือนกระจกออกมาทั้งหมดต่อตัน 1 ตัน <input type="checkbox"/> การปล่อยก๊าซเรือนกระจกออกมาทั้งหมดต่อน้ำตาล 1 ตัน <input type="checkbox"/> การปล่อยก๊าซเรือนกระจกออกมาทั้งหมดต่อเอทานอล 1 ลิตร <p>อื่น ๆ (โปรดระบุ)</p> <input type="text"/>
<p>15. Looking at biodiversity and ecosystem management, in Sugar cane in Thailand, how will you assess the following capacities?</p> <ul style="list-style-type: none"> <input type="checkbox"/> Key environmental issues are covered by an appropriate and implemented environmental impact and management plan <input type="checkbox"/> Ratio of fertilizer (N & P) applied <input type="checkbox"/> Monitoring of Agro-chemicals applied per hectare per year <input type="checkbox"/> List and implementation of banned agro-chemicals applied per hectare per year <p>Other (please specify)</p> <input type="text"/>	<p>16. หากพิจารณาเรื่องความหลากหลายทางชีวภาพและการจัดการกับระบบนิเวศของการผลิตน้ำตาลอ้อย ในประเทศไทย คุณประเมินความสามารถเหล่านี้ได้อย่างไร</p> <ul style="list-style-type: none"> <input type="checkbox"/> มีการแก้ปัญหาสภาพแวดล้อมที่เป็นปัญหาใหญ่โดยใช้แผนการจัดการผลกระทบสิ่งแวดล้อมที่เหมาะสม <input type="checkbox"/> มีการใช้อัตราส่วนปุ๋ย (N&P) <input type="checkbox"/> มีการควบคุมสารเคมีที่ใช้ในการเกษตรเป็นสเตปส์ต่อปี <input type="checkbox"/> มีการแบนสารเคมีที่ใช้ในการเกษตรเป็นสเตปส์ต่อปี <p>อื่น ๆ (โปรดระบุ)</p> <input type="text"/>

<p>16. Looking at continuous improvement of business in the sugar cane in Thailand, how will you assess the following capacities?</p> <ul style="list-style-type: none"> <input type="checkbox"/> Training of employees and other workers in all areas <input type="checkbox"/> Continuous improvement of the status of soil and water resources <input type="checkbox"/> Continuous improvement of the quality of sugarcane and products from the sugar mill <input type="checkbox"/> Promotion of energy efficiency <input type="checkbox"/> Reduction of emissions <input type="checkbox"/> Promotion of recycling of waste streams <input type="checkbox"/> Effective and focused research, development and extension expertise <input type="checkbox"/> Transparent, consultative and participatory processes that address cumulative and induced effects via an environmental and social impact assessment (ESIA) <input type="checkbox"/> Active engagement and transparent, consultative and participatory processes with all relevant stakeholders <input type="checkbox"/> Economic sustainability Promotion <p>Other (please specify):</p> <input type="text"/>	<p>17. หากพิจารณาเรื่องการพัฒนาอย่างต่อเนื่องของธุรกิจการผลิตน้ำตาลอ้อยในประเทศไทย คุณเห็นด้วยกับข้อความต่อไปนี้มากเพียงใด</p> <ul style="list-style-type: none"> <input type="checkbox"/> มีการฝึกอบรมลูกจ้างและพนักงานในทุกพื้นที่ <input type="checkbox"/> มีการพัฒนาคุณภาพดินและทรัพยากรน้ำอย่างต่อเนื่อง <input type="checkbox"/> มีการพัฒนาคุณภาพน้ำตาลอ้อยและผลิตภัณฑ์จากโรงงานผลิตน้ำตาลอย่างต่อเนื่อง <input type="checkbox"/> ใช้พลังงานให้คุ้มค่าที่สุด <input type="checkbox"/> ลดการปล่อยก๊าซเรือนกระจก <input type="checkbox"/> รับผิดชอบต่อสังคม <input type="checkbox"/> มีงานวิจัย การพัฒนาและการถ่ายทอดที่มีประสิทธิภาพและถูกต้อง <input type="checkbox"/> มีขั้นตอนที่โปร่งใส ผ่านการปรึกษาและการมีส่วนร่วมของทุกภาคส่วนซึ่งจะแก้ปัญหาที่สะสมและตามมาผ่านการประเมินผลกระทบทางสภาพแวดล้อมและสังคม (ESIA) <input type="checkbox"/> มีส่วนร่วมและมีขั้นตอนที่โปร่งใส ผ่านการปรึกษาและการมีส่วนร่วมของทุกภาคส่วนกับหุ้นส่วน <input type="checkbox"/> มีการยกระดับความยั่งยืนทางเศรษฐกิจ <p>อื่น ๆ (โปรดระบุ):</p> <input type="text"/>
<p>17. Looking at labor conditions in Sugar cane in Thailand, how much will you agree with the following?</p> <ul style="list-style-type: none"> <input type="checkbox"/> Minimum wage and benefits required by law <input type="checkbox"/> Maximum number of hours worked <input type="checkbox"/> Overtime is paid <input type="checkbox"/> Payment for cane deliveries are made according to agreed <input type="checkbox"/> Existence of a contract <p>Other (please specify):</p> <input type="text"/>	<p>14. หากพิจารณาเรื่องสภาพชีวิตของแรงงานในสวนของการผลิตน้ำตาลอ้อยในประเทศไทย คุณเห็นด้วยกับข้อความต่อไปนี้มากเพียงใด</p> <ul style="list-style-type: none"> <input type="checkbox"/> มีค่าจ้างขั้นต่ำและผลประโยชน์ตามที่กฎหมายกำหนด <input type="checkbox"/> มีการกำหนดชั่วโมงการทำงานสูงสุด <input type="checkbox"/> มีการจ่ายค่าล่วงเวลา <input type="checkbox"/> มีการจ่ายค่าส่งอ้อยตามที่กำหนดไว้ <input type="checkbox"/> มีสัญญา <p>อื่น ๆ (โปรดระบุ):</p> <input type="text"/>
<p>18. In your opinion, how shall sugar cane sustainability be supported at cane growing level?</p> <ul style="list-style-type: none"> <input type="radio"/> Farmers engagement and training <input type="radio"/> Farmers' price premium <input type="radio"/> Mechanization and Technology <input type="radio"/> Supply chain transformation 	<p>18. คุณคิดว่าจะมีการสนับสนุนการปลูกน้ำตาลอ้อยให้ยั่งยืนได้อย่างไร</p> <ul style="list-style-type: none"> <input type="radio"/> การมีส่วนร่วมและการฝึกอบรมผู้ปลูกอ้อย <input type="radio"/> ปรับราคาให้ชาวผู้ปลูกอ้อยได้กำไรมากขึ้น <input type="radio"/> การใช้เครื่องจักรและเทคโนโลยี <input type="radio"/> การเปลี่ยนห่วงโซ่อุปทาน
<p>19. In your opinion, how shall sustainability be supported at sugar cane production level?</p> <ul style="list-style-type: none"> <input type="radio"/> Governmental policies <input type="radio"/> Financial incentives <input type="radio"/> Traders' policies <input type="radio"/> Traders' incentives <input type="radio"/> Technology <input type="radio"/> farmers' engagement 	<p>19. คุณคิดว่าจะมีการผลิตน้ำตาลอ้อยให้ยั่งยืนได้อย่างไร</p> <ul style="list-style-type: none"> <input type="radio"/> นโยบายจากภาครัฐ <input type="radio"/> แรงกระตุ้นทางการเงิน <input type="radio"/> นโยบายของผู้ค้า <input type="radio"/> แรงกระตุ้นของผู้ค้า <input type="radio"/> เทคโนโลยี <input type="radio"/> การมีส่วนร่วมของผู้ปลูกอ้อย
<p>20. In your opinion, how shall sugar cane sustainability be supported at trade level?</p> <ul style="list-style-type: none"> <input type="radio"/> Governmental policies <input type="radio"/> Buyers' sustainable purchasing policies <input type="radio"/> Financial incentives <input type="radio"/> Regional market liberalization <input type="radio"/> Technology <input type="radio"/> Farmers' engagement <input type="radio"/> Traders commitment to sustainability 	<p>20. คุณคิดว่าจะมีการค้าอ้อยให้ยั่งยืนได้อย่างไร</p> <ul style="list-style-type: none"> <input type="radio"/> นโยบายจากรัฐบาล <input type="radio"/> นโยบายการซื้อสินค้าที่ยั่งยืนจากผู้ซื้อ <input type="radio"/> แรงกระตุ้นทางการเงิน <input type="radio"/> การเปิดตลาดเสรีในระดับภูมิภาค <input type="radio"/> เทคโนโลยี <input type="radio"/> การมีส่วนร่วมของชาวนา <input type="radio"/> ผู้ค้ายึดความยั่งยืนเป็นหลัก ในการค้า

APPENDIX B: FOCUS GROUP DISCUSSION – INVITATION AND OVERVIEW



THAILAND SUGAR CANE SECTOR STAKEHOLDERS' ENGAGEMENT

Focus Discussion: Challenges & Opportunities toward sustainability



WHY ?

As a stakeholder of the Thai sugarcane sector, your feedback is important. It will help us to better understand opportunities and challenges to move sustainability implementation in this sector, using BonSucro as a driver. By combining the views of the various stakeholders, we believe that win-wins can be identified to drive changes toward the benefit of all stakeholders' group.

WHO?

Stakeholders are made of i) representatives of the industry, related and non-related to the sustainability area ; ii) non-for-profits representatives with strong involvement and knowledge of the sector to identify opportunities for dialogues and iii) representatives from governmental agencies representatives

HOW?

Participation will be facilitated using the Sustainability Compass methodology; we will ask you to put ideas on sticky notes to visualize gaps and opportunities and foster solution minded and system thinking.

METHODOLOGY



FairAgora Asia will use the Sustainability Compass methodology for discussions to bring participants around a common understanding and shared vision. It will support the mapping of the current sustainability directions as a real compass: North/Nature, East/Environment, South/Being.

www.fairagora.com
Drive Change. Create Value.

FOCUS DISCUSSION

March 2nd
4-6 pm

or

March 3rd
9-11am

Bangkok [Asok]

Exact location to be confirmed in return of participants' name list

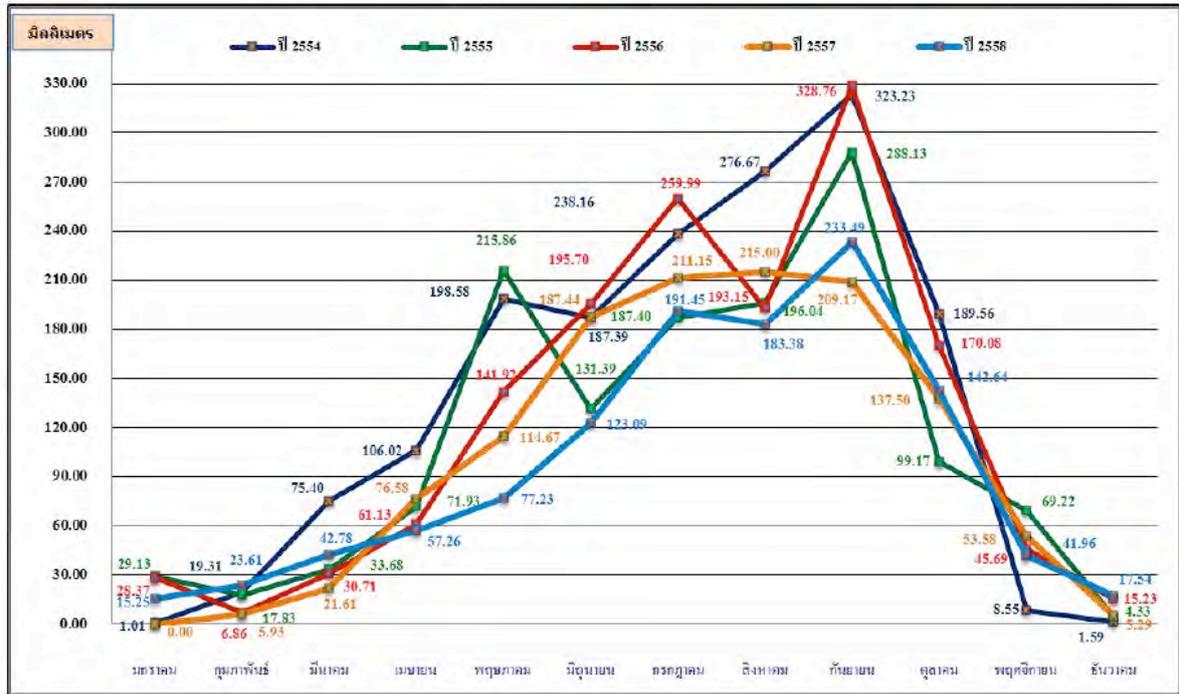
APPENDIX C: THAILAND'S EXPORTS OF RAW SUGAR (MTRV)

	2010	2011	2012	2013	2014	2015	2016
China	782,081	1,248,555	1,786,363	1,768,320	1,713,410	1,839,027	1,839,027
Indonesia	533,887	1,107,829	868,700	748,868	771,205	647,831	647,831
Japan	134,261	507,330	482,409	499,226	375,251	462,343	462,343
North Korea	120,375	324,600	372,543	181,750	477,524	254,130	254,130
South Korea	81,372	43,400	99,220	131,328	62,579	201,620	201,620
Malaysia	56,367	53,282	182,791	114,866	243,136	187,067	187,067
Philippines	4,617	192,673	839,576	50,838	495,016	170,227	170,227
Russia	1,539	2,334	1,898	17,852	31,801	18,357	18,357
Singapore	22,868	23,784	20,993	0	15,940	14,525	14,525
Sri Lanka	8,824	7,643	513	20,366	15,800	7,454	7,454
Tanzania	0	205	282	564	53,917	462	462
Taiwan	7,206	19,971	149	66	129	203	203
United States	20,273	18,515	3,263	0	0	0	0
UAE	29,365	3,335	0	0	0	0	0
Vietnam	31,652	174,542	49,453	33,858	37,298	0	0
Others	138,547	495,536	212,883	137,002	137,450	130,500	130,500
	1,973,234	4,223,534	4,921,036	3,704,904	4,430,456	3,933,746	3,933,746

APPENDIX D: THAILAND'S EXPORTS OF REFINED SUGAR (MTRV)

	2010	2011	2012	2013	2014	2015
China	20,894	95,507	157,083	214,068	263,704	756,115
Burma	13,086	34,934	49,210	116,818	138,118	706,838
Cambodia	468,756	409,016	632,147	683,528	564,631	518,834
Malaysia	35,858	28,869	98,018	157,085	225,600	266,312
Vietnam	179,179	263,384	249,518	146,661	53,552	192,682
Singapore	101,933	174,113	130,786	109,053	136,511	156,655
Laos	31,987	44,443	85,028	32,743	39,710	107,848
South Korea	544	14,408	22,730	41,363	63,772	99,452
Sri Lanka	68,108	44,071	51,789	50,572	95,894	78,586
Indonesia	522,883	103,610	135,254	81,076	80,847	73,597
Philippines	266,813	126,829	81,961	74,316	50,059	65,256
Jordan	27	12,085	51,266	66,076	96,070	38,788
Syria	0	10,745	7,838	27,606	35,310	35,821
Tanzania	9,071	28,576	24,813	58,744	39,854	25,094
Saudi Arabia	803	18,470	9,067	32,927	34,928	21,353
Kenya	5,566	31,898	42,496	95,632	36,575	13,936
UAE	21,645	45,597	13,669	27,266	62,199	11,718
India	348,499	6,426	7,592	7,218	10,657	10,229
Brunei	6,337	6,561	6,561	2,247	4,494	6,206
Yemen	1,498	3,123	5,466	2,649	7,655	4,826
Maldives	776	936	990	936	1,284	2,318
Russia	0	776	161	0	497	776
Somalia	0	0	0	5,992	15,539	535
Pakistan	178,485	2,676	936	348	6,133	408
Bangladesh	2,140	11,856	0	266	767	348
Iran	0	6,420	0	0	98	15
North Korea	5,230	4,140	0	0	2,140	0
Others	354,896	1,128,162	1,010,893	1,047,206	1,073,442	1,143,551
	2,645,014	2,657,631	2,875,272	3,082,396	3,140,040	4,338,097

APPENDIX E: RAINFALL DATA, 2011 - 2015



Source: OCSB, 2016

APPENDIX F: CANE BURNING IN THAILAND



Cane Burning Problem in Thailand



Dr. Prasert Tapaneyangkul
Secretary-General
Office of the Cane and Sugar Board
Thai-Queensland Sugar Industry Dialogue
25 March 2010
Samui Island, Surathani

Region		2008/09	2009/10
North	Cane prod.(mln.tons)	18.71	17.438
	Burnt cane(%)	74.4	72.92
	C.C.S	12.33	11.59
	Sugar prod.(mln.tons)	2.01	1.73
Central	Sugar yield(K.g./toncane)	107.53	98.98
	Cane prod.(mln.tons)	21.78	21.52
	Burnt cane(%)	59.45	60.99
	C.C.S	12.06	11.11
East	Sugar prod.(mln.tons)	2.32	2.99
	Sugar yield(K.g./toncane)	106.42	97.52
	Cane prod.(mln.tons)	3.23	3.53
	Burnt cane(%)	75.23	66.52
N.E	C.C.S	11.88	11.09
	Sugar prod.(mln.tons)	3.34	3.43
	Sugar yield(K.g./toncane)	103.35	98.57
	Cane prod.(mln.tons)	22.75	23.62
Average	Burnt cane(%)	56.92	57.92
	C.C.S	12.55	11.94
	Sugar prod.(mln.tons)	110.95	2.44
	Sugar yield(K.g./toncane)	2.52	103.27
Average	Cane prod.(mln.tons)	66.46	66.11
	Burnt cane(%)	63.57	63.34
	C.C.S	12.33	11.53
	Sugar prod.(mln.tons)	7.19	6.61
Average	Sugar yield(K.g./toncane)	108.13	100.02

Cane burning in Thailand

- increasing remarkably
- Mechanized harvest:<10% (500 cane harvesters in the country)
- Becoming typical practice
- Environmental and human concerns
- Ecological cane management practice
- Trade regulation/non tariff barriers(NTBs)
- Brazil: ban cane burning practices in CS region by 2031



Burnt Cane



Impacts of Cane burning

- Emit green house gas
- Endanger human health
- Reduce biodiversity
- Diminish quantity and quality of sugar recovery
- More costly and less efficient processing
- Soil damage: loss of nutrients, organic matters, humus, bacteria, microorganisms
- Diminish potential of biomass for cogeneration power plants



Air Quality: Critical

Bangkok Post The world's window to Thailand

Smog Hits Emergency Levels

Chiang Mai, the jewel of northern Thailand, is shrouded in a blanket of cancerous smoke. Famous tourist landmarks like Doi Suthep lie hidden, smothered by smog and invisible to the eye

The Pollution Control Board, Regional Area Air Quality Data webpage shows **Chiang Mai's PM 10 levels are dangerously high at 268.4 micrograms/cubic meter, Mae Sai 328 and Mae Hong Son a staggering 437.8 (Standard level: 120).**

"The number of people seeking emergency help for asthma, allergies and COPD [Chronic Obstructive Pulmonary Disease] is much higher now. The air is so polluted and today. The PM 10 levels are so high."

14 March 2010



Growers revenue loss

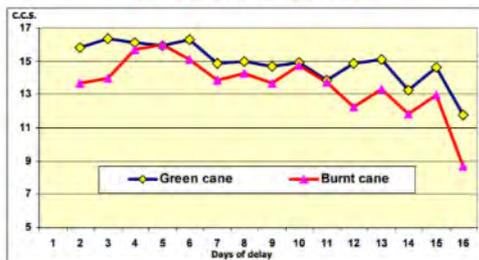
Burnt cane	1 day	2 days	3 days	4 days
Weight loss (%)	3	5.1	7.2	8.9
Revenue loss (mnl.baht)	1,281	2,178	3,074	3,800

Based on:

- Estimated 2009/2010 cane production: 69 mln.tons
- Cane price 1,020 baht/ton at 12.33 C.C.S.



Growers revenue loss



• Estimated 2009/2010 cane production: 69 mln.tons
 • Cane price 1,020 baht/ton at 12.33 C.C.S.
 • 1 C.C.S. loss/ton cane = -58 baht/ton cane
 or total revenue loss: 4,002 mln.baht

Green cane harvesting promotion

1. Educate cane growers
2. Green harvest campaign
3. Penalty and promotion measures:
 - **Burnt cane:** fine 20 baht/ton
 - **Green cane:** additional 70 baht/ton
4. Soft loan scheme (3 yrs) for buying cane harvesters (1,000 mln.baht/yr.)



APPENDIX G: WORKSHOP NOTES - FAIRAGORA SESSION IN BONSUCRO TECHNICAL WEEK

SUGARCANE GROWERS

Opportunities

Positive attributes of sugarcane:

- Climate in Thailand is conducive to cane growing
- Cane only needs replanting every 3-5 years
- Contract farms receive direct support from mills (e.g. loans for production inputs, machines)

Advantages to be fully realised:

- Opportunities to improve practices with green fertiliser and crop rotation
- Diversification – value chain is organised and co-ordinated, with market opportunities available to producers in relation to by-products. There is also the potential for farmers to diversify agricultural production and plant other crops such as tapioca, maize etc. but farmers would need some support from the mill to do this.
- Middlemen – currently distribute quota to farmers and act as brokers between mills and farmers. Given their role and level of interaction, is there an opportunity to use middlemen more effectively to collect/manage farmer data and/or disseminate information?

Challenges

Low productivity

- Indication that there are pathogens/disease – Ratoon stunting disease - but need tests to confirm and better crop varieties to mitigate
- Productivity - Low yield due to soil quality. Increasing tonnage per ha will also increase sugar per HA.
- Cane burning still widely used (this reduces yield) but mechanised options are expensive and need to be cheaper to be accessible to smaller farmers

Costs of production

- Farmers don't have money so need access to capital – especially after natural disasters like major droughts or floods.
- Shortage of labour – nobody wants to cut cane in Thailand anymore so they often rely on migrant labourers instead but the cost of labour is getting higher, further reducing available profit
- Cane trucks cannot be loaded more than 25 tons (now a legal requirement) but cane farmers keep doing it because otherwise, it costs them more money (for additional truckloads).

Other

- Mill doesn't own land so hard to control/change farm practices
- Farmer selection – it is difficult to get farmers to change (especially where mills have no direct ownership or contract with them).
- Most farmers do not have evidence to prove land ownership (or right to water use)

Recommendations

Stop burning cane – it leads to lower yields and higher costs (more waste!). Alternative forms of mechanisation that can be used in Thailand (and in smallholder farms) need to be explored.

Farmer training

- Farmer training/education – Education for farmers should be free and focus on areas to such as productivity training, new techniques, soil adaptation etc. The training could be through agronomists from mills, from extension agents or colleges.
- Training programs – should only involve farmers that are ready to adopt new practices. A screening process is needed because mills want to make sure that the right farmers participate – those that will help improve yield by adopting new practices and collecting data to demonstrate impact.
- Data collection training needed for farmers

Research and investment

- Increase research into new scientific farming techniques (as opposed to traditional methods), with bespoke advice available to address field-specific issues (e.g. based on soil type)
- Breed new varieties of sugarcane (or improve exchange programmes with other countries)

SUGARCANE MILLS

Challenges

- Sugar is a commodity with limited market opportunities – it is the same product so to expand opportunities, need to find new markets (like India and China). The recommendation is to get Bonsucro certification to differentiate it from other sources.
- CCS is inconsistent so need to adjust the value to get a higher percentage of sugar. Note: factors affecting CCS level = soil, geography, and TK

Equipment/machines

- Mills are generally low-tech - better equipment/technology is needed in many locations e.g. new high-pressure boilers to improve efficiency (resulting in lower energy consumption) but this requires significant capital investment. Maintenance costs can also be high due to damage from sand, rocks and other contaminants found in sugarcane but quality control with farmers to reduce the quantity of dirt on sugarcane (price related control mechanism) has the potential to lower costs.

Recommendations

- Need to have a continuous improvement program in place with transport companies, millers and farmers need to improve the way they are cutting cane and how to make better use, this will help to reduce cost
- Need to explore new markets for Bonsucro products (and Bonsucro needs to help promote these products).

SUGARCANE TRADERS

Opportunities

- Get Bonsucro certified to expand market opportunities – energy and environmental conservation is better for the country and improves reputation with the community at the same time.
- The government provides support to the value chain through the system of benefit sharing (70:30) and quota system.

Challenges

- Buyers don't want to pay a premium for sugar - since Thai sugar sells at a higher price than other countries, there is limited incentive for buyers to produce sustainable sugarcane.
- Recent allegations by Brazil at the WTO that the Thai government is providing subsidies to support sugar production is likely to result in a change in the support provided. Although the type/extent of change has yet to be determined, it is expected that there will be an adverse effect on sugarcane producers.
- Greater distance from markets of Europe/US where there is greater demand for sustainable sugar but also higher transport costs.

Recommendations

- If government subsidies that are currently used to support/maintain profitability in the sugarcane industry, such as through benefit sharing, are no longer allowed - it was suggested that these subsidies could be re-directed to help improve agricultural practices. Farm improvement/training programs, as well as better R&D into agricultural tools and technologies appropriate for Thailand, were highlighted as possible options.

READINESS MAP

Principle 1 – obey the law

- 1.1. Compliance with national laws – The workshop participants stated that Thailand had a lot of laws in place (for mills and farms) but felt that awareness and compliance were likely higher at the mills than at the

farm level. It was agreed that readiness at the mill level was therefore probably medium to high and for farms, it was likely lower (although there was a lack of knowledge so the level of compliance is unknown).

1.2. Demonstrate clear title to land and water in accordance with national practice and law

- Land title – smallholders (and many other farmers) often lack clear records or title of ownership. In Thailand, there are different kinds of land titles and different kinds (like rice ownership certification or permits) are associated with different land use rights – this specifies the type of activity and area. About 70 to 80 of land is rented by farmers from an agent or someone they trust – this is through a verbal contract and often through a long-term arrangement.
- However, the legal system is not favourable regarding rights transfer especially for farmers (even if they have used the land for generations) – they can't do it without proper documents. This means that the family inherits the land but current law is not favourable to selling it.
- Water – permits are required to dig for artesian wells. Farmers know this but don't always get them, particularly in situations where proof of land title/use rights is lacking. Mills are concerned that if they go to farmers and require them to get water permits, they may be subject to retroactive fines/imprisonment, which would effectively stop any level of co-operation and/or engagement with the implementation of the standard.

For consideration by Bonsucro: To what extent is there a risk or conflict over ownership – because this is the real intent of the indicator. Bonsucro should adapt this title to state that land should not be acquired from illegal means or from reserved land. Land/water rights title – how could this indicator be better adapted to suit smallholders or should changes be made to the guidance for auditors so the auditor can assess in a fair and balanced way (and not translate literally)?

Principle 2 – respecting labour rights/human rights

2.1 Compliance with ILO conventions on child/forced labour, discrimination and freedom of association

2.2 Safe and healthy workplace conditions

Investment capability is key to improving working conditions. The group felt strongly that there were no problems with child/forced labour at the mills – and that there was a high level of awareness about these issues - but accepted that children were involved at the farm level (as part of smallholder family farm).

Investment in mechanisation at the farm level would also reduce labour requirements and more specifically, the use of labour in cane cutting which is potentially hazardous. At the mill level, the level of PPE use was high because it was provided by the mills and use by employees was also enforced. There was a problem with PPE use in farms (unless provided by the farm).

Principle 3 – managing input, production and processing efficiencies

3.1 To monitor/measure production and process efficiency

3.2 To monitor GHG emissions with a view to minimising

Investment capital is needed to improve efficiency in mills and farms. Increased use of mechanisation at the field level could reduce cane burning but is this enough? The group felt that it would be very difficult to stop this practice – government regulation was needed to truly bring about change.

Training capabilities and data collection – feedback loop for farmers to help manage inputs more efficiently and increase yields/productivity

Principle 4 – actively managing biodiversity and ecosystem services

4.1 To assess impact of sugarcane on biodiversity

Low soil quality and burning practice – requirement is to monitor quality and manage through feedback loops