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# ACKNOWLEDGEMENTS
Co-ordinated by Bonsucro, this study was initiated and funded by PepsiCo with support from Corbion.

We would like to thank the respondents and interviewees who shared their experience and expertise throughout and helped this report to reflect the views of stakeholders across the sugarcane sector.

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

| Identification of key stakeholders | • 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. |
| Thai sugarcane market analysis     | • 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. |
| Consideration of key sustainability factors | • 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

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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. Production is divided into 93% of the plantation for crushing at the sugar mill and 7% of the plantation for seedlings for field planting and planting area is in compliance with the Notification of the OCSB. 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).](image)

Source: Sugarcane production annual report 2016, OCSB.

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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. 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.

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)

<table>
<thead>
<tr>
<th>Typology</th>
<th>Planted area (ha)</th>
<th>Production capacity (MT/year)</th>
<th>Sugarcane farmers by region</th>
<th>Total (by typologies)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Northern</td>
<td>Central</td>
</tr>
<tr>
<td>Small</td>
<td>&lt; 10</td>
<td>&gt; 1,000</td>
<td>45%</td>
<td>47%</td>
</tr>
<tr>
<td>Medium</td>
<td>10 - 32</td>
<td>1,000 - 2,000</td>
<td>40%</td>
<td>35%</td>
</tr>
<tr>
<td>Large</td>
<td>&gt; = 32</td>
<td>&gt; 2,000</td>
<td>15%</td>
<td>19%</td>
</tr>
<tr>
<td>Total (by regions)</td>
<td></td>
<td></td>
<td>22%</td>
<td>33%</td>
</tr>
</tbody>
</table>

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.](image)

**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.

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>
<thead>
<tr>
<th>Year</th>
<th>Ethanol consumption (million litres/day)</th>
<th>Ethanol production (million litres)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>2.6</td>
<td>936.5</td>
</tr>
<tr>
<td>2014</td>
<td>3.2</td>
<td>1,058.3</td>
</tr>
<tr>
<td>2015</td>
<td>3.5</td>
<td>405.3 (YTD - April 2015)</td>
</tr>
</tbody>
</table>

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. 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.

- 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.

- 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.

![Figure 4 - Sugarcane mills by regions (2015).](image)

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

<table>
<thead>
<tr>
<th>Company name</th>
<th>Number of mills</th>
<th>Annual crushing capacity (MT of sugar)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mitr Phol Group</td>
<td>6</td>
<td>20.68</td>
</tr>
<tr>
<td>Thai Roong Ruang Group</td>
<td>7</td>
<td>15.19</td>
</tr>
<tr>
<td>Thai Ekalak Group (KTIS)</td>
<td>3</td>
<td>9.8</td>
</tr>
<tr>
<td>Tamaka Group (KSL)</td>
<td>5</td>
<td>8.75</td>
</tr>
<tr>
<td>Korach Group</td>
<td>2</td>
<td>5.84</td>
</tr>
<tr>
<td>Rerm Udom Group</td>
<td>2</td>
<td>5.72</td>
</tr>
<tr>
<td>Wang Kanai Group</td>
<td>4</td>
<td>5.45</td>
</tr>
<tr>
<td>Suphanburi Group</td>
<td>5</td>
<td>5.25</td>
</tr>
<tr>
<td>Banpong Group</td>
<td>4</td>
<td>4.26</td>
</tr>
<tr>
<td>Kumpawapi Group</td>
<td>2</td>
<td>3.8</td>
</tr>
<tr>
<td>Kam Pang Petch Co., Ltd.</td>
<td>2</td>
<td>3.55</td>
</tr>
<tr>
<td>Mitr Kasetr Group</td>
<td>2</td>
<td>3.16</td>
</tr>
<tr>
<td>Prachuap Sugar Industry Co., Ltd</td>
<td>1</td>
<td>2.29</td>
</tr>
<tr>
<td>Rajburi Sugar Co., Ltd.</td>
<td>1</td>
<td>2.15</td>
</tr>
<tr>
<td>Pranburi Sugar Industry Co., Ltd.</td>
<td>1</td>
<td>1.95</td>
</tr>
<tr>
<td>Eastern Sugar &amp; Cane Public Co.</td>
<td>1</td>
<td>1.36</td>
</tr>
<tr>
<td>Rayong Sugar Co., Ltd.</td>
<td>1</td>
<td>1.26</td>
</tr>
<tr>
<td>Khonburi Sugar Public Co., Ltd.</td>
<td>1</td>
<td>1.03</td>
</tr>
<tr>
<td>Saharuang Co., Ltd.</td>
<td>1</td>
<td>1.01</td>
</tr>
<tr>
<td>E - Saan Sugar Industry Co., Ltd.</td>
<td>1</td>
<td>0.59</td>
</tr>
<tr>
<td>Burirum Sugar Public Co., Ltd.</td>
<td>1</td>
<td>0.52</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>51</strong></td>
<td><strong>105.96</strong></td>
</tr>
</tbody>
</table>

---

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

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.
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.

**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 a 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/kg\(^{10}\), excluding the 7 % of VAT. Retail prices for sugar also remain fixed at 21.85 THB/kg\(^{11}\)(including VAT) for white sugar and 22.85 THB/kg\(^{12}\) 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
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.

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\(^ {13}\) Available at [https://www.wto.org/english/tratop_e/dispu_e/cases_e/ds507_e.htm](https://www.wto.org/english/tratop_e/dispu_e/cases_e/ds507_e.htm).

\(^ {14}\) Available at [https://www.internationalsugarjournal.com/thailand-to-reform-its-sugar-regime/](https://www.internationalsugarjournal.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.

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

<table>
<thead>
<tr>
<th>Year</th>
<th>Total sugar production (million MT)</th>
<th>Quota A (1) (million MT)</th>
<th>Quota B (2) (million MT)</th>
<th>Quota C (3) (million MT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>10.24</td>
<td>2.30</td>
<td>0.8</td>
<td>7.14</td>
</tr>
<tr>
<td>2013</td>
<td>10.02</td>
<td>2.61</td>
<td>0.8</td>
<td>6.61</td>
</tr>
<tr>
<td>2014</td>
<td>11.33</td>
<td>2.40</td>
<td>0.8</td>
<td>8.13</td>
</tr>
<tr>
<td>2015</td>
<td>11.33</td>
<td>2.50</td>
<td>0.8</td>
<td>8.03</td>
</tr>
<tr>
<td>2016</td>
<td>9.78</td>
<td>2.60</td>
<td>0.8</td>
<td>6.38</td>
</tr>
</tbody>
</table>

(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.

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>
<thead>
<tr>
<th>Year</th>
<th>Raw sugar (mill tonnes)</th>
<th>Refined sugar (mill tonnes)</th>
<th>Total (mill tonnes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>1.97</td>
<td>2.65</td>
<td>4.62</td>
</tr>
<tr>
<td>2011</td>
<td>4.22</td>
<td>2.66</td>
<td>6.88</td>
</tr>
<tr>
<td>2012</td>
<td>4.92</td>
<td>2.88</td>
<td>7.80</td>
</tr>
<tr>
<td>2013</td>
<td>5.99</td>
<td>3.08</td>
<td>8.79</td>
</tr>
<tr>
<td>2014</td>
<td>3.70</td>
<td>3.14</td>
<td>7.57</td>
</tr>
<tr>
<td>2015</td>
<td>4.43</td>
<td>4.34</td>
<td>8.77</td>
</tr>
<tr>
<td>2016</td>
<td>4.4</td>
<td>0.46</td>
<td>4.86</td>
</tr>
</tbody>
</table>

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).

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

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.

![Sugarcane value chain from agricultural production to processing and trading.](image)

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/lb.\(^\text{15}\)
- **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.

![Q. What are main opportunities in sugarcane growing?](image)

\(^{\text{15}}\) 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.

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.
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 BONSUCRO

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 Directive**

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.

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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

- Government policy & environmental sustainability and climate benefit of green technology for bioethanol production in Thailand, Kawasaki et al., 2015.
- I Vongkusokit, July 2016, Bangkok Sugar Conference New Challenges and Opportunities of Thai Sugar Industry.
- K Taechaphimol, Khon Kaen University, 2014, Project cost, productivity and knowledge transfer to reduce the cost of sugarcane production 2557/58.
- P Weerathaworn, 2015, Developments on global sugarcane markets: challenges for Thailand producers.
## APPENDIX A: QUESTIONNAIRE – ENGLISH & THAI VERSIONS

1. Sugar cane sector can be organized in 3 type of activities: growing, production/transformation or trade; which group do you think you represent?

- [ ] Growing cane
- [ ] Sugar production or ethanol production
- [ ] Trade or sugar or ethanol

2. Can growing activities: the majority of sugar mills in Thailand don’t grow their own cane. Only a few have their own sugar plantation. This sugar mills establishes contract farming with the sugarcane growers and provides them seasonal credit.

The majority of sugarcane growers is still small and medium farm. Their production capacity is about 1000 to 3000 MT. Only 17% of them is considered large with the annual production more than 2,000 MT.

In general, the sugar mills signed the contract with the sugarcane growers lessor or quota head, which is often a sugarcane grower with a large cane area.

The cane area covers 47 provinces, which is divided in 85% of the plantation for the sugar mill and 15% for the plantation for the existing sugarcane growing tenants about 8% of total agriculture in Thailand.

The sugarcane production in 2017 is forecasted about 91.06 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 intensive rain during the harvesting season.

### On comments

Comment:

3. In your opinion, in relation to the Sugarcane growing, what are the opportunities for Thailand?

- [ ] Low production costs
- [ ] Competitive production season
- [ ] Other (please specify)

4. In your opinion, in relation to the Sugarcane growing, what are the challenges for Thailand?

- [ ] Low sugarcane yield
- [ ] Cane disease
- [ ] Improper culture practices
- [ ] Use of low sugarcane varieties
- [ ] Variability of cane quality
- [ ] Cane burning
- [ ] Labor shortage
- [ ] Mechanical
- [ ] Other (please specify)

5. The environment and conditions of making a living from sugarcane growing.

- [ ] Low market price
- [ ] Low sugar price
- [ ] Other (please specify)

6. The main advantage of using sugarcane is:

- [ ] Low production costs
- [ ] Competitive production season
- [ ] Other (please specify)

7. What are the main challenges of sugarcane growing?

- [ ] Low market price
- [ ] Low sugar price
- [ ] Other (please specify)
6. In your opinion, in relation to the Sugarcane production, what are the opportunities for Thailand?

- Policy support and measures to maintain profitability
- Restriction of sugar mill and trader license
- Control over sugar output by the quota allocation for domestic consumption and for exports
- Fixed domestic retail prices
- Establishment of benefit sharing system between sugarcane planters and sugar mills (70-30)
- Selection of by-products such as ethanol, biomass electricity generation, paper pulp, fertilizer, particulate board, etc.

7. In your opinion, in relation to the Sugarcane production, what are the challenges for Thailand?

- High variation in output
- Climate change issues
- Severe floods
- Drought
- Other (please specify)

8. Sugarcane trade activities:

- For domestic market, the guide for the sugar for the domestic consumption falls into the A category. A richer sugar for domestic consumption, either only or is organized by government trading.
- For export, Thailand remains a major sugar producer and the world’s second-largest exporter, making up most of its annual production.
- Sugarcane production increased from 2.57 million MT in 2014 to 4.27 million MT in 2019, rising by 62.14% mostly in the form of non-sugar sugar. More than 60% of Thailand’s sugar exports are sold in the Asian countries, where Thailand sugar enjoys an export opportunities. A total of 3.2% of Thailand’s sugar exports are sold in the Asian countries, where Thailand sugar enjoys an export opportunities. A total of 3.2% of Thailand’s sugar exports are sold in the Asian countries, where Thailand sugar enjoys an export opportunities. A total of 3.2% of Thailand’s sugar exports are sold in the Asian countries, where Thailand sugar enjoys an export opportunities.
- Thailand also exports sugar to China, India, Vietnam, and Indonesia. Thailand also exports sugar to China, India, Vietnam, and Indonesia.

9. In your opinion, in relation to the Sugarcane trade, what are the opportunities for Thailand?

- Proximity of the main export destination (Asian markets)
- Economic integration
- Market price fluctuation
- Other (please specify)
10. In your opinion, in relation to the Sugarcane trade, what are the challenges for Thailand?

- Market price fluctuation
- Decrease of world sugar stockpiles
- practitioners of man-made prices
- Suggestive speculative demands in the commodity markets
- Other (please specify)

11. Looking at human rights performance in the sugar cane in Thailand, how much will you agree with the following?

- The sugarcane planter associations/souls agree and support all sugar mills to prevent child labor and forced labor through the industry supply chain.
- Every sugar mill is committed to paying wages in terms of legal labor and exposes buying cane produced by child labor and forced labor.
- At sugar mills in the country comply with labor laws and international labor standards.
- Other (please specify)

12. Looking at Health and Safety performance in Sugar cane in Thailand, how much will you agree with the following?

- Farm provide a safe and healthy working environment in each plant operations
- Feed mills provide a safe and healthy working environment in each plant operations
- Small health and safety risks are assessed and measures to mitigate the risk are implemented.
- Appropriate personal protective equipment supplied to and used by all worker
- Staff trained in health and safety
- Access to drinking water in sufficient quantity
- Access to first aid and provisions for emergency response.
- Other (please specify)

13. Looking at labor conditions in Sugar cane in Thailand, how much will you agree with the following?

- Minimum wage and benefits required by law
- Maximum number of hours worked
- Overtime is paid
- Payment for cane deliveries are made according to agreed
- Existence of a contract
- Other (please specify)

14. Looking at production monitoring and process efficiency in Sugar cane in Thailand, how will you assess the following capacities?

- Yzza raw materials used being product
- Yzza production
- Yzza overall time
- Yzza production index
- Industrial Efficiency
- Net GHG emissions per tonne of cane
- Net GHG emissions per tonne of sugar
- Net GHG emissions per unit of energy
- Other (please specify)

15. Looking at biodiversity and ecosystem management, in Sugar cane in Thailand, how will you assess the following capacities?

- Key environmental issues are covered by an appropriate and implemented environmental impact and management plan.
- Ratio of forest lost to harvested
- Monitoring of Agro- chemicals applied per hectare per year
- Lapse and implementation of banned agro-chemicals applied per hectare per year
- Other (please specify)
<table>
<thead>
<tr>
<th>Question</th>
<th>Options</th>
</tr>
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<tbody>
<tr>
<td>16. Looking at continuous improvement of business in the sugar cane in Thailand, how will you assess the following?</td>
<td>- Training of employees and other workers in all areas</td>
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<td></td>
<td>- Continuous improvement of the work and milk water resources</td>
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<td></td>
<td>- Continuous improvement of the quality of sugarcane and products from the sugar mill</td>
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<td>- Promotion of energy efficiency</td>
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<td>- Reduction of emissions</td>
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<td>- Promotion of recycling of waste sources</td>
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<td>- Effective, cost-effective, research, development and extension effort</td>
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<td>- Transparents, conscious and participatory processes that address cumulative and induced effects, via an environmental and social impact assessment (ESIA)</td>
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<td></td>
<td>- Active engagement and transparent consultation and participation with all relevant stakeholders</td>
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<td></td>
<td>- Economic sustainability/Innovation</td>
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<tr>
<td>Other (please specify):</td>
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<tr>
<td>17. Looking at labor conditions in sugar cane in Thailand, how much will you agree with the following?</td>
<td>- Minimum wage and benefits required by law</td>
</tr>
<tr>
<td></td>
<td>- Maximum number of hours worked</td>
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<td>- Overtime is paid</td>
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<td>- Payment for cane deliveries are made according to agreed</td>
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<td></td>
<td>- Existence of a contract</td>
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<tr>
<td>Other (please specify):</td>
<td></td>
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<tr>
<td>18. In your opinion, how shall sugar cane sustainability be supported at cane growing level?</td>
<td>- Farmers’ engagement and training</td>
</tr>
<tr>
<td></td>
<td>- Farmers’ price premium</td>
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<td></td>
<td>- Mechanization and technology</td>
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<td>- Supply chain transformation</td>
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<td>19. In your opinion, how shall sustainability be supported at sugar cane production level?</td>
<td>- Governmental policies</td>
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<td>- Financial incentives</td>
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<td></td>
<td>- Traders’ policies</td>
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<td>- Technology</td>
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<td></td>
<td>- Farmers’ engagement</td>
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<td>20. In your opinion, how shall sugar cane sustainability be supported at trade level?</td>
<td>- Governmental policies</td>
</tr>
<tr>
<td></td>
<td>- Buyers’ sustainable purchasing policies</td>
</tr>
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<td>- Financial incentives</td>
</tr>
<tr>
<td></td>
<td>- Regional market liberalization</td>
</tr>
<tr>
<td></td>
<td>- Technology</td>
</tr>
<tr>
<td></td>
<td>- Traders’ commitment to sustainability</td>
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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 sugar cane sector, your feedback is important. It will help us to better understand opportunities and challenges to move sustainability implementation in this sector. Using FairAgora 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,

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Drive Change. Create Value.
## APPENDIX C: THAILAND’S EXPORTS OF RAW SUGAR (MTRV)

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

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<td>7,655</td>
<td>4,826</td>
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<td>Maldives</td>
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<td>936</td>
<td>990</td>
<td>936</td>
<td>1,284</td>
<td>2,318</td>
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<tr>
<td>Russia</td>
<td>0</td>
<td>776</td>
<td>161</td>
<td>0</td>
<td>497</td>
<td>776</td>
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<tr>
<td>Somalia</td>
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<td>0</td>
<td>0</td>
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<td>15,539</td>
<td>535</td>
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<td>Pakistan</td>
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<td>2,676</td>
<td>936</td>
<td>348</td>
<td>6,133</td>
<td>408</td>
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<td>Bangladesh</td>
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<td>11,856</td>
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<td>266</td>
<td>767</td>
<td>348</td>
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<td>4,140</td>
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<td>0</td>
<td>2,140</td>
<td>0</td>
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<td>Others</td>
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<td>1,010,893</td>
<td>1,047,206</td>
<td>1,073,442</td>
<td>1,143,551</td>
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<td></td>
<td>2,645,014</td>
<td>2,657,631</td>
<td>2,875,272</td>
<td>3,082,396</td>
<td>3,140,040</td>
<td>4,338,097</td>
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</tbody>
</table>
APPENDIX E: RAINFALL DATA, 2011 - 2015

Source: OCSB, 2016
APPENDIX F: CANE BURNING IN THAILAND

Cane Burning Problem in Thailand

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

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

Smoke 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 levels: 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

<table>
<thead>
<tr>
<th>Weight loss (%)</th>
<th>1 day</th>
<th>2 days</th>
<th>3 days</th>
<th>4 days</th>
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</thead>
<tbody>
<tr>
<td>Burnt cane</td>
<td>3</td>
<td>5.1</td>
<td>7.2</td>
<td>8.9</td>
</tr>
</tbody>
</table>

Revenue loss (mn.bht)

| Burnt cane | 1,281 | 2,178 | 3,074 | 3,800 |

Based on:
- Estimated 2009/2010 cane production: 69 mn.tons
- Cane price 1,020 baht/ton at 12.33 C.C.G.

Growers revenue 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 mn.bht/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 Bonsuco 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