A Primer on PEF’s Priority Commodities: Industry Study on Cane Sugar
TABLE OF CONTENTS

LIST OF TABLES ................................................................. i
LIST OF ABBREVIATIONS .................................................... iii
INTRODUCTION ................................................................. 1
What is the state of the global trade in sugar? ........................................ 1
What is the origin of the Philippine sugarcane industry? ............................. 2
What is the current state of the Philippine sugar industry? ......................... 3
Who are the big players in the sugar industry? ....................................... 5
How do sugar markets operate? ................................................................ 6
What do farmers need to know in sugar production? ................................... 7
Is there income from sugarcane farming? ............................................... 7
What are the alternatives for value addition and expansion of income streams? 7
What are the new technology options for improving productivity? ............. 8
What is the domestic policy environment in the sugar industry? .................. 9
What are the challenges confronting the sugar industry? ......................... 10
What are the options to enhance competitiveness? ................................... 11
REFERENCES ........................................................................... 13

LIST OF TABLES

Table 1. World Sugar Balances, 2009/10 (thousand tons, raw value – October/September Year) ............................................................... 2
Table 2. Area Planted and Volume of Production, CropYear 2009/10 – 2013/14 .......... 4
Table 3. Area Planted and Volume of Sugarcane Production*, by Major Provinces .... 4
Table 4. Domestic Withdrawals and Quota to the U.S. ..................................... 5
Table 5. Philippine Export Shipments to the U.S. and the World Market .......... 5
Table 6. Sugarcane Crop Growth Phases ....................................................... 7
## LIST OF ABBREVIATIONS

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>AFTA</td>
<td>ASEAN Free Trade Area</td>
</tr>
<tr>
<td>ASEAN</td>
<td>Association of Southeast Asian Nations</td>
</tr>
<tr>
<td>BAS</td>
<td>Bureau of Agricultural Statistics</td>
</tr>
<tr>
<td>CEPT</td>
<td>Common Effective Preferential Tariff</td>
</tr>
<tr>
<td>DA</td>
<td>Department of Agriculture</td>
</tr>
<tr>
<td>DAR</td>
<td>Department of Agrarian Reform</td>
</tr>
<tr>
<td>DOE</td>
<td>Department of Energy</td>
</tr>
<tr>
<td>FAO</td>
<td>Food and Agriculture Organization</td>
</tr>
<tr>
<td>HA</td>
<td>Hectare</td>
</tr>
<tr>
<td>HYV</td>
<td>High Yielding Varieties</td>
</tr>
<tr>
<td>ISO</td>
<td>International Sugar Organization</td>
</tr>
<tr>
<td>MT</td>
<td>Metric Ton</td>
</tr>
<tr>
<td>PCARRD</td>
<td>Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development</td>
</tr>
<tr>
<td>PHILSURIN</td>
<td>Philippine Sugar Research Institute</td>
</tr>
<tr>
<td>SCBIPH</td>
<td>San Carlos Bio-Energy Philippines Inc.</td>
</tr>
<tr>
<td>SDI</td>
<td>Subsurface Drip Irrigation</td>
</tr>
<tr>
<td>SRA</td>
<td>Sugar Regulatory Administration</td>
</tr>
</tbody>
</table>
INTRODUCTION

The sugar industry in the Philippines is synonymous with the sugar cane industry. This is because sugar cane is one of the country’s major crops and the main source of centrifugal or refined sugar. This sugar is also more affordable than sugar extracts from coconut, corn, or beets.1 Globally, the main sources of sugar are sugar cane and beets. Both contain large quantities of sucrose.

Sugar cane or Saccharum officinarum has been cultivated in tropical climates in South Asia and Southeast Asia since ancient times. It is a tall, perennial grass that forms lateral shoots at the base to produce multiple stems, typically three to four meters high and about five centimeters in diameter. Pure cane sugar is non-GMO or not a genetically modified organism. Traditional cane refining demands two processes at two different facilities. 2

What is the state of the global trade in sugar?

The average person consumes about 24 kilograms of sugar each year (33.1 kg in industrialized countries), equivalent to over 260 food calories per person, per day. According to the 2003 FAO data, 70% of the world’s white crystal sugar came from sugarcane and 30%, from sugar beet. The total production area of sugarcane in the world was at 20.42 million hectares with 1.333.2 million tons in aggregate volume of production and an average productivity of 65.2 tons/hectare.

Fifteen of the 121 sugar producing countries covered 86% of the area and 87% of production. Brazil had the highest production area (5.343 million hectares) and volume of production (386.2 million tons), followed by India, China, and Thailand. Australia had the highest productivity (85.1 tons/hectare). The Philippines ranked 10th in terms of production area (0.385 million hectares) and volume of production 25.8 million tons; the country was seventh in terms of productivity (67.1). Currently, Brazil and Thailand stand as the topmost producers globally with a combined output of about 46 million MT.

Global production for 2013-2014 was estimated at 175 million MT, a decrease of 1 million MT from the previous year because of lower production in India and Russia. Even the U.S. sugar beet production was reportedly lower by 90,000 MT from the previous year’s total production of 8.1 million MT. However, this was offset by the growth in China and Thailand per the International Sugar Organization (ISO). ISO predicts that world sugar production will still exceed consumption, and prices will go down.

As of 2009/2010, global output stood at 159.8 million MT compared to global demand of 167.1 million MT (see Table 1). The biggest producers were Brazil, India, and China, which were also the biggest source of demand during the period. The Philippines contributed 2.2 million MT to the global output against domestic demand of 2.1 million MT. During the same period, the global trade in sugar suffered an imbalance with net imports totalling 52 million MT while net exports totalled 45.3 million MT.

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1Beets grow in temperate climate and is the main sugar product in the U.S. and Europe.
Table 1. World Sugar Balances, 2009/10 (thousand tons, raw value – October/September Year)

<table>
<thead>
<tr>
<th>Country</th>
<th>Production</th>
<th>Consumption</th>
<th>Total Net Imports</th>
<th>Total Net Exports</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brazil</td>
<td>38025</td>
<td>12400</td>
<td>-</td>
<td>25920</td>
</tr>
<tr>
<td>India</td>
<td>17300</td>
<td>23000</td>
<td>5900</td>
<td>-</td>
</tr>
<tr>
<td>China</td>
<td>14000</td>
<td>15500</td>
<td>575</td>
<td>-</td>
</tr>
<tr>
<td>Thailand</td>
<td>8000</td>
<td>2425</td>
<td>-</td>
<td>5625</td>
</tr>
<tr>
<td>USA</td>
<td>7300</td>
<td>9860</td>
<td>2500</td>
<td>-</td>
</tr>
<tr>
<td>Indonesia</td>
<td>3150</td>
<td>4900</td>
<td>1165</td>
<td>-</td>
</tr>
<tr>
<td>Australia</td>
<td>4900</td>
<td>1135</td>
<td>-</td>
<td>3965</td>
</tr>
<tr>
<td>Philippines</td>
<td>2250</td>
<td>2175</td>
<td>-</td>
<td>85</td>
</tr>
<tr>
<td>World Total</td>
<td>159887</td>
<td>167134</td>
<td>52079</td>
<td>45378</td>
</tr>
</tbody>
</table>

Source: International Sugar Organization (ISO)

What is the origin of the Philippine sugarcane industry?

Sugar was grown as a subsistence crop long before it became an export commodity. Sugar cane production expanded in the 18th century with the onset of the sugar plantations in the West Indies and the Americas. Previous to this, people used honey to sweeten their food.

The earliest recorded sugarcane cultivation and plantation can be traced to India in the 5th century. Merchant Arab Persian vessels from the Celebes brought sugar cane cuttings to Mindanao thousands of years before the Spanish colonization. Eventually, sugarcane cultivation by the native inhabitants spread further north to the Visayan islands and Central Luzon.

The Spanish colonizers introduced the encomienda which granted big tracts of land to the Filipino elite who became big sugar plantation owners or hacenderos, millers, and traders and exporters in Iloilo and Negros. By the 1570s, sugarcane was planted in large numbers in Bulacan, Cebu, Pampanga, Laguna, and Pangasinan. The hacienda system which evolved, particularly in Negros, was built on sharecropping and debt relations. It was founded on a paternalistic relationship between the rich sugar families, all with Spanish roots, and the tenant farmers.

The Spanish monopoly of the galleon trade restricted the entry of Asian ships bringing in Asian goods to the Port of Manila. A shift in the world market in 1815 resulted in the abandonment of the Manila-Acapulco galleon trade. Shortly after, direct and tariff-free trade between the islands and Spain started and cash crops were cultivated for trade with Europe and Latin America. Sugar became a lucrative cash crop and the Spanish colonizers started the large-scale cultivation of sugarcane in the hacienda and introduced the hacenderos to foreign commerce. By the 1860s, Negros Occidental was the colony’s “sugar bowl” and the Ilonggo planters, the wealthiest among the regional elite.

The sugar trade between the Philippines and the United States started when the SS Astrea of Salem docked in Manila upon the lifting of restrictions at the Port of Manila by a Spanish Royal Decree in 1796. Since then, the U.S. has become the country’s principal export market. With its excellent harbor, Manila became an open port for Asian, European, and North American traders in 1834.

3 Henderson, Clarence, June 2000.
In 1873, additional ports were opened to foreign commerce. By the late 19th century, sugar, tobacco, and abaca were the dominant Philippine exports. By the first decade of the 20th century, the sugar industry started modernizing under American colonial rule. Preferential treatment was given to Philippine sugar exports to the U.S. In 1902, by an act of the U.S. Congress, Philippine sugar could enter the U.S., paying only 75% of the duty or 1.685 cents per pound. In 1909, the U.S. Congress passed the Payne-Aldrich Tariff Act. Under this free trade arrangement 300,000 tons of sugar could be admitted to the U.S., free of duty.

In 1913, the U.S. Underwood-Simmons Tariff Law removed the quantitative limitation on duty-free products of the Philippines entering the U.S. Under this stimulus, the Philippine sugar industry developed and expanded to 47 mills and increased production by 502% – from 206,000 tons in the 1912-1913 crop years to 1,565,405 tons in 1933-1934. Under the U.S. sugar quota system, Philippine sugar was duty-free and got the lion's share of foreign sugar supply to the U.S. When the Philippines was granted commonwealth status in 1934, sugar exports became subject to limited quota instead of unlimited free market trade. The quota was later extended under the Laurel-Langley Agreement to last beyond the date of Philippine independence in 1946 and which expired in 1974.

In the 1960s, the United States severed relations with Cuba. To abort a sugar shortage, it granted the Philippines an increase in the sugar quota despite the provisions of the Laurel-Langley Agreement. The Philippines, in response to an expanded market, launched a crash program to meet the demand. Cultivation was extended to marginal forest lands, and even lands planted to rice were converted to sugarcane. When the U.S. Sugar Act expired and the Laurel-Langley Agreement was terminated in 1974, the downward trend of the industry was further triggered by the drop in prices, from U.S. 65 cents to U.S. 6 cents per pound in 1977.

The Philippines has a regular sugar quota to the United States of 136,201 metric tons commercial weight (MTCW) or an equivalent metric tons raw value (MTRV) of 142,160 for the current crop year, 2014. As a legacy of the U.S. colonial period, oligopolies have dominated the economy, particularly in agriculture, where sugar lands remain concentrated in large estates. Throughout the colonial times, the income gap between the few rich plantation owners/hacienderos and the many tenant-farmers and sugar workers/sacadas grew wider. The situation gave rise to agrarian unrest. Consequent administrations, both under the U.S. colonial rule and the Philippine presidential administrations, launched land reform programs. However, the lack of sustained political will and the resistance of the big landlords who dominate Congress then and now have rendered the program ineffective.

What is the current state of the Philippine sugar industry?

Sugarcane is one of the country’s top agricultural exports. The sugarcane industry contributes PHP 76 billion annually to the national economy. Currently, sugarcane is cultivated in 419,71 hectares producing 24.3 million MT of cane, 2.4 million MT of raw sugar, and 984,941 MT of refined sugar (Sugar Regulatory Commission). Around 62,000 farmers and 600,000 farm workers depend on the industry for livelihood and income (www.bas.gov.ph).
Table 2. Area Planted and Volume of Production, Crop Year 2009/10 – 2013/14

<table>
<thead>
<tr>
<th>Crop Year</th>
<th>Sugarcane Areas (Has.)</th>
<th>Milled Lkg Sugar/Day in Metric Tons</th>
<th>Raw Sugar Production (MT)</th>
<th>Refined Sugar Production (MT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009 - 2010</td>
<td>385,662</td>
<td>19,135.2223</td>
<td>1,970,785</td>
<td>984,203</td>
</tr>
<tr>
<td>2010-2011</td>
<td>395,492</td>
<td>26,664,481</td>
<td>2,399,116</td>
<td>823,827</td>
</tr>
<tr>
<td>2011-2012</td>
<td>422,384</td>
<td>23,873,252</td>
<td>2,244,131</td>
<td>936,187</td>
</tr>
<tr>
<td>2012-2013</td>
<td>424,132</td>
<td>24,859,028</td>
<td>2,461,838</td>
<td>1,054,895</td>
</tr>
<tr>
<td>2013-2014*</td>
<td>419,721</td>
<td>24,345,983</td>
<td>2,418,001</td>
<td>984,941</td>
</tr>
</tbody>
</table>

*As of 25 May 2014

Data source: Sugar Regulatory Administration (SRA)

Data from the Bureau of Agricultural Statistics (BAS) slightly vary from the Sugar Regulatory Commission, placing sugar cultivation areas at 422,384 hectares producing 26.4 MT of sugarcane. The Visayas region has the biggest sugarcane hectarage and produces about 65% of the country’s sugar output. Within the region, Negros Island accounts for 57% production. Table 3 below shows the top producing provinces in terms of area of production (in hectares) and volume of production (in metric tons).

Table 3. Area Planted and Volume of Sugarcane Production*, by Major Provinces

<table>
<thead>
<tr>
<th>Major Province</th>
<th>Area of Production (in Hectares)</th>
<th>Volume of Production, Yr 2012 (MT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Philippines</td>
<td>422,384</td>
<td>26,395,893.23</td>
</tr>
<tr>
<td>Negros Occidental</td>
<td>183,051</td>
<td>12,868,723.60</td>
</tr>
<tr>
<td>Bukidnon</td>
<td>76,372</td>
<td>12,868,723.60</td>
</tr>
<tr>
<td>Batangas</td>
<td>30,390</td>
<td>1,697,936.00</td>
</tr>
<tr>
<td>Negros Oriental</td>
<td>36,127</td>
<td>1,697,936.00</td>
</tr>
<tr>
<td>Iloilo</td>
<td>21,024</td>
<td>1,697,936.00</td>
</tr>
</tbody>
</table>

* Sugarcane production exceeding 1 million metric tons

Data Source: Bureau of Agricultural Statistics (BAS) website at [www.bas.gov.ph/sit](http://www.bas.gov.ph/sit)

The mills are practically the sugar storekeepers and withdrawals are arranged through the “quedan”, an official receipt (O.R.) issued by the mill for producers’ stocks according to classification, such as: “B” for domestic consumption; “A” for the U.S. Quota; and, “D” for exports to the World Market. From 2009 to 2014, domestic consumption of raw sugar (based on volume of withdrawal from sugar mills) averaged around 2 million MT per year (SRA). Around 200,000 MT is shipped to the US annually as fulfillment of the US sugar quota. Consumption in the form of supply utilization/processing food use was at 26,131,934 MT in 2012 and utilization per capita kg/yr was at 2.70. There is an increasing demand by the food processing industry for sugar. The demand for sugarcane for ethanol production is also expected to rise as more ethanol plants become operational. Ethanol consumption of domestic sugar is less than 10 percent.

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4 CountryStat_brochure 2012.pdf.BAS.
5 USDA GAIN: Philippines Sugar Annual 2013.
Table 4. Domestic Withdrawals and Quota to the U.S.

<table>
<thead>
<tr>
<th>Crop Year/Quota Year</th>
<th>Domestic Withdrawals (MT Raw Sugar)</th>
<th>Quota to the U.S. (MT Commercial Weight)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009-2010</td>
<td>1,943,443</td>
<td>170,958</td>
</tr>
<tr>
<td>2010-2011</td>
<td>1,716,505</td>
<td>203,602</td>
</tr>
<tr>
<td>2011-2012</td>
<td>2,029,866</td>
<td>211,201</td>
</tr>
<tr>
<td>2012-2013</td>
<td>2,184,512</td>
<td>138,827</td>
</tr>
<tr>
<td>2013-2014</td>
<td>1,773,241</td>
<td>136,201</td>
</tr>
</tbody>
</table>

Source of data: SRA

The ratio of domestic consumption to exports to the U.S. and the world market is 70:30. Domestic consumption is further distributed as follows: 50% industrial users, 32% households, and 18% institutions such as restaurants, bakeshops, hospitals, and others.

Table 5. Philippine Export Shipments to the U.S. and the World Market

<table>
<thead>
<tr>
<th>Export Shipments QY</th>
<th>U.S. (MTCW)</th>
<th>FOB Value (U.S.$)</th>
<th>World Market (MTCW)</th>
<th>FOB Value (U.S.$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009-2010</td>
<td>170,957</td>
<td>77,485,053.58</td>
<td>21,120.00</td>
<td>5,689,397.90</td>
</tr>
<tr>
<td>2010-2011</td>
<td>212,505</td>
<td>141,427,631.41</td>
<td>35,801.93</td>
<td></td>
</tr>
<tr>
<td>2011-2012</td>
<td>200,562</td>
<td>n.a.</td>
<td>332,083.70</td>
<td></td>
</tr>
<tr>
<td>2012-2013</td>
<td>51,688</td>
<td>n.a.</td>
<td>141,488.94</td>
<td>66,111,022.71</td>
</tr>
<tr>
<td>2013-2014</td>
<td>59,440</td>
<td>n.a.</td>
<td>126,407.50</td>
<td></td>
</tr>
</tbody>
</table>

Source of data: SRA

Despite being a major sugar producer and the largest recipient of U.S. sugar quota, the Philippines is a minor player in the international sugar market due to its high production costs. Contributory to this are inefficient/wasteful use of farm inputs, some inefficient traditional farm practices, lack of financing and infrastructure support, and the decreasing number of second-generation skilled farm labor as a result of young people’s preference for urban-based labor.

Who are the big players in the sugar industry?

Other than the big landlords who monopolize land ownership and plantation revenues, the other big players are millers, distillers, and refineries.

There are 29 operating millers of raw sugarcane with a combined crushing capacity of 185,000 metric tons of cane per day. Alongside are 14 refineries with a combined capacity of 8,000 MT of refined sugar per day operating at 70% of mill capacity. Victorias Milling (in Negros Occidental) is the biggest of the refining sector with a capacity of 25,000 50-kilo bags per day. A variety of technologies are used in the refineries including carbonation, ion exchange resin, phosphatation, and granular activated carbon. Recovery is about 0.92 metric ton of refined sugar per metric ton of raw sugar. The sugar industry has also responded to the demand for biofuels. There are four bioethanol distillers with a total annual rated capacity of 133 million liters. The emergence of

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4 USDA Gain: “Philippines Sugar Annual 2013”.
5 Ibid.
distillers has, in fact, intensified the competition for raw sugar cane. In San Carlos City (Negros Occidental), the local supply of cane from 9,000 hectares of sugarcane farms in the district has shifted to support the needs of the San Carlos Bio-Energy Philippines Inc. (SCBIPH). This distiller has a capacity of 125,000 liters of anhydrous fuel grade ethanol per day or 30 million liters annually; this is equivalent to 10% of the country’s total requirement for a five percent (5%) gasoline-ethanol blend by 2009 (scbiph.com). The SCBIPH ethanol plant needs 400,000 MT of sugarcane annually.

By geographic location, there are seven sugar mills and one distillery in Luzon; 18 sugar mills and three distilleries in the Visayas; and four sugar mills in Mindanao.

How do sugar markets operate?

The domestic trade in sugar has a unique system called the “quedan” system. Under this system, the sugarcane planter allocates a percentage of the output of his/her sugar to the mill in payment for the processing of the cane. The grower gets 70% of the sugar and molasses while the mill retains 30%. However, the application of the sharing scheme varies. For example, Crystal Sugar Company, Inc. retains 36% of the sugar and molasses, and growers get 64%. In Bicol, the producers also get 64% and the millers, 36%.

Sugar planters are issued quedans or warehouse receipts, which are given as soon as the sugar is processed. The receipt states the name of the planter and sugar produced in 50 kilogram bags. Quedans are classified as “A” for the U.S. Quota, “B” for the Domestic Market, “C” for the food processors who export their products, and “D” for revenues.

The SRA determines the proportion of sugar designated for different types of quedan. Currently, only A & B quedans are assigned to producers. The “A” sugar is based on the volume of the quota allocated to the Philippines under the U.S. TRQ system and the estimated volume of production for the crop year. This is normally less than 10% of total domestic output. The rest of the output (90%) is classified as B sugar.

Because the quedan is a negotiable instrument and the bearer may use it to withdraw sugar stocks at any time, there is a thriving secondary market for quedans. Planters usually sell the quedans to local traders who, in turn, resell them to bigger traders. The big traders accumulate the quedans and subsequently sell them in bulk to wholesalers, distributors, or processors who withdraw sugar from the mills. The processors use the sugar as an input for food and beverage processing; the wholesalers and distributors sell their sugar to major retailers. From the retailers, the sugar eventually reaches consumers through supermarkets, wet markets, and sari-sari (mom-and-pop) stores.

Sugar mills and planters’ associations and cooperatives do not market and sell sugar collectively. Individual planters, mostly small, sell their sugar to a ladder of traders. Too many hands add to the price as sugar volumes undergo consolidation prior to refining; again the sugar has to go through another ladder of traders, distributors, and dealers prior to reaching the retail markets. Essentially, big traders assume the role of quedan consolidators rather than product distributors (Zabaleta, 1997).

Commented [j1]: Is this correct?
What do farmers need to know in sugar production?

The sugar planting time in the Philippines is from October to May. There are four crop growth phases of sugarcane with their respective growth periods over a 12-month crop season: germination, tillering, grand growth phase and maturity, and ripening (see Table 6).

<table>
<thead>
<tr>
<th>Sugarcane Crop Growth Phase</th>
<th>Start</th>
<th>Lasts</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Germination Phase</td>
<td>7-10 days</td>
<td>30-35 days</td>
</tr>
<tr>
<td>2. Tiller (Formative) Phase</td>
<td>40 days after planting</td>
<td>120 days</td>
</tr>
<tr>
<td>3. Grand Growth Phase</td>
<td>20 days after planting</td>
<td>270 days</td>
</tr>
<tr>
<td>4. Maturity and Ripening Phase</td>
<td>3 months</td>
<td>270-360 days</td>
</tr>
</tbody>
</table>

Source: Netafim website at www.sugarcanecrops.com/agronomic_practices/planting_time/.

The initial cost of production for a one-hectare sugar farm is PHP 58,640. The cost covers various activities from land preparation, to planting and maintenance. This excludes harvesting which is an important activity comprising 30-35% of total cost.

Is there income from sugarcane farming?

Sugarcane ‘block farming’ is a farming system proposition that can benefit from government and private sector support. It aims to improve yield, income, and sustainability of sugarcane farms. The convergence initiative of the DA-DAR-SRA on block farming expects to reduce the cost of production from PHP 1,100 to PHP 900 per LKg and increase farm productivity from 60 to 75 tons of cane per ha.

What are the alternatives for value addition and expansion of income streams?

1. **Crop diversification**: Sugarcane farms can be diversified to accommodate other crops which will not disturb production but will enhance soil organic composition and contribute to increase in output and income. An example is banana which is a cash crop of commercial value and whose waste is rich in potassium for organic fertilizer. Madre de cacao is also suitable for intercropping with sugarcane. It is high in nitrogen content and its matured branches can be processed into charcoal for local fuel. Corn is another major crop that thrives in the same environment as sugarcane.

2. **Product diversification**: This includes the production of bioethanol or renewable fuel from sugarcane and molasses. Ethanol is reportedly, the most efficient fuel compared to gasoline in the last 40 years. The Department of Energy (DOE) computed savings for every liter of displaced imported fuel = US$0.64/liter. The total volume of displaced gasoline/hectare of production of sugarcane = 4,550 liters using bioethanol = US$2912/hectare dollar savings at 10% of the total sugarcane.

11 www.netmba.com/strategy/value-chain/
production processed into bioethanol = US$117,65 million/year in total foreign exchange savings.12

Product diversification also includes bioelectricity production from bagasse. Bagasse, the remaining fiber after sugarcane is crushed, is used as fuel for the boilers of sugar mill to generate power and electricity.

3. Production of innovative products such as bioplastics. Ethanol from sugarcane is a substitute for petroleum in the production of plastic. The so-called ‘bioplastics’ have the same physical and chemical properties of regular plastic but maintain full recycling capabilities. They are renewable too. The sugarcane polyethylene content replaces 30% or more of the petroleum. ‘Bioplastics’ also have lower carbon footprint.

4. Production of organic fertilizer from mud press. Filter cake or mud press is a chocolate, sticky waste during juice extraction of cane stalks. It contains 5-15% protein, calcium and phosphorus; 5-15% sugar; 10-30% fiber; 10-20% ash and other micronutrients. It is a by-product with a high potential as organic fertilizer and animal feed; also, it is a source of sugarcane wax and methane gas for fuel when processed.

What are the new technology options for improving productivity?

There are two new technology options for increasing sugar productivity:

1. Proper varietal selection and use of high-yield varieties. High-tonnage, disease- and pest-resistant, climate-resilient sugarcane varieties are being developed by the Philippine Sugar Research Institute (PHILSURIN) in partnership with the Philippine Genome Center. Two projects were conducted in 2009 to promote the adoption of high yielding varieties (VMC 84-549 and VMC 84-524) at the farmers’ field in the mill districts of Pampanga and Tarlac.

   The results of the demonstration in Pampanga showed that Phil 75-44 performed well in the district. However, VMC 84-524 [97.02 ton cane per hectare (TC/ha)] out yielded both Phil 75-44 (80.14 TC/ha) and VMC 84-549 (83.98 TC/ha) while VMC 84-549 registered the highest sugar recovery (1.85 Lkg/ha). In Tarlac, Phil 74-64 out yielded other varieties by 0.88 TC/ha. In terms of sugar yield per hectare (kg/ha), VMC 84-524 out yielded Phil 74-64 by 6.78 bags. The VMC varieties produced significantly more sugar in Pampanga than in Tarlac (PCARRD Annual Report 2009).

PHILSURIN, with its breeding station in Victorias City, Negros Occidental, has announced the release of three new high yielding varieties (HYVs), namely; PSR 01-105, PSR 02-247, and PSR 01-136. Of the three, PSR 01-105, proved outstanding for national release while the two others, PSR 02-247 and PSR 01-136, can be recommended for specific districts such as: PSR 01-105 for HPCo, VMC, Lopes, San Carlos, Capiz, Passi, Bogo, Bukidnon, Davao and Tarlac (10 out of 11 test sites); PSR 02-247 - HPCo, Victorias, and Bukidnon and selected parts of San

Carlos and Lopez mill districts where the soils are sandy loams and not clayey (popular check VMC 86-550 dominated areas); and, PSR 01-136 for HPCo, Victorias, Bogo, Davao and Tarlac (five mill districts showing better sugar yield than check varieties).

2. **Subsurface drip irrigation (SDI) system.** Drip irrigation is defined as the precise, slow, and frequent application of water through point or line source emitters on or below the soil surface at a small operating pressure (20-200 kPa) and at a low discharge rate (0.6 to 20 LPH), resulting in partial wetting of the soil surface. This technology was applied in Kabankalan, Negros Oriental and resulted in improved cane yield. Compared to the yield of a conventional overhead sprinkler irrigation at 70.0 tons/ha, the subsurface drip yield (SDI) increased by 90% (133.5 tons/ha). This ratio is comparative to the potential cane yields (120 to 150 tons/ha) achieved in Brazil, India, South Africa, and other regions growing sugarcane with drip irrigation and fertigation.

**What is the domestic policy environment in the sugar industry?**

Philippine sugar policy is generally controlled by the Philippine DA’s Sugar Regulatory Administration, working closely with various influential industry stakeholders. During the start of each crop year, the SRA issues a central policy (known as Sugar Order No. 1) on the production and marketing of sugar in the country. This basically allocates how much of production goes to the domestic and export market, as well as for reserves. These “orders” are adjusted as the season progresses. In September 2012, the SRA earmarked 82% of the estimated 2.3 million MT production for the domestic market, 8% for the world market, and 10% for the US. SRA policies serve as a stabilizing factor in allocating domestic supply.

The international discourse on biofuels and renewable energy has also influenced the domestic policy on sugar. In 2007, Republic Act 9367 (RA 9367) was signed into law which mandates that gasoline and diesel be blended with bio-fuel at five percent (5%) to 10% and two percent (2%), respectively. However, the original goal has not been achieved. Currently, there are four operational distilleries or ethanol plants that can produce only 133 million liters per year leaving an 80% gap from the total requirement of 486 million liters (as of 2012). The bioethanol gap is filled in by imports from Brazil, Thailand, and India.

A provision for risks and losses due to natural calamities, pests, and diseases is an important component of domestic policy. Under PD 1467, sugarcane is included in the list of high-value commercial crops covered by the Philippine Crop Insurance Corporation (PCIC). However, only irrigated farms or areas with irrigation water are eligible for crop insurance coverage. Rain-fed farms can only be covered during the wet season. The PCIC insurance support experience, however, has been discouraging. Records covering the 1981 to 2000 period show that only 1,357 out of 7,690 claims or PHP 8.5 million of the PHP 255.1 million total value of claims were paid (PCIC).

The national policy promoting organic agriculture (RA 10068 or the Organic Agriculture Act of 2010) provides a platform to promote climate-resilient agriculture by not using synthetic pesticides and fertilizers. Currently, there are 35,000 farms using organic farm management practices. The DA and DOST are promoting vermiculture for organic fertilizer production and the use of trichoderma as a beneficial microorganism (BMO) to hasten bio-organic composting. In the banking and finance community, government has introduced a new policy to promote credit facilities to organic farmers.

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13 Sugar Regulatory Administration (SRA) website at [http://www.sra.gov.ph/policy_so.html](http://www.sra.gov.ph/policy_so.html)

requiring all banks (public and private) to set aside at least 25% of total loanable funds to agriculture and fisheries credit.10

The SRA promotion of block or cluster farming in convergence with the DA and DAR needs close monitoring. The intention is to narrow down the gap in land-based resources and improving cost-efficiency through large-scale production. The creation of block farms also aims to facilitate provision of extension services.

Under the block farming system, small farms of less than 10 hectares will be consolidated and integrated into 30 to 50-hectare farms through joint ventures, contracting, partnership, and sharing. The ultimate goal is to transform these smallholdings into large, well-managed farms that can reach 100 tons of cane sugar per hectare compared to just 50 tons per hectare on small farms.

According to the SRA, block farming could increase production from 99 to 147 bags of sugar per hectare, resulting in increases in agrarian workers’ incomes to around PHP 39,000 ($885). The program envisions to provide capacity to the 79% smallholders to become cost-efficient and highly productive in preparation for the challenges of the ASEAN tariff reduction on imported sugar. Come 2015, this will be pegged at zero to five percent (0-5%), under AFTA’s Common Effective Preferential Tariff (CEPT). To date, 29 block farms have been organized while four are operational. The four operating block farms are located in Balayan, Nasugbu, and Lian, Batangas.

Each farmer beneficiary is both an investor and partner to the proposed project. As investor, he/she contributes to the use of the land for farming; as partner, he/she is the primary worker to the farm. In three years, farmer beneficiaries will increase their farming knowledge, as well as their productivity and income, by an average of 68%.

The block farm project applies public-private partnership (PPP) of the DA-SRA-DAR and the sugarcane farmers particularly the Agrarian Reform Beneficiaries (ARBs), Mill District Development Committees (MDDCs), sugar mills, LGUs, and other sugar industry stakeholders. Six block farms became operational in 2012 and 22 more in 2013.

A major cause of concern is the fate and welfare of 600,000 sugar workers who do not fall under the category of producers. The question is how far they will also benefit from block farming. Per SRA data, there are 62,000 sugarcane farmers in the country, majority (79%) of whom have landholdings of less than five hectares in size with an average production capacity of 5.03MT/ha.; less than one percent (1%) has a farm bigger than 100 hectares with an average production capacity of 7.34MT/ha. Other farms have sizes of 10 to 50 hectares (11%), or have sizes as big as 50 to 100 hectares (2%).

The one percent of producers belongs to four major sugar planter federations and three millers associations which account for 90% of the country’s total domestic sugar production. The “79%” planters and millers who do not belong to these affiliations produce the remaining 10 percent.

What are the challenges confronting the sugar industry?

The main challenge confronting the Philippine sugar industry is how to improve competitiveness in view of new trade arrangements. The Philippines’ trade policy has not undergone any major changes since 2005. Tariffs are the main policy instrument for protecting the domestic industry. The country has entered into bilateral agreements with 15

preferential partners including those under new ASEAN Regional Trade Agreements (RTAs), namely: Australia and New Zealand, China, India, Japan, and Korea. Despite these numerous trade agreements, the country has no effective recourse against sugar smuggling particularly from co-ASEAN members like Thailand. It has already lodged complaints for three anti-dumping investigations in 2005 and 13 cases from 1999-2003.

The Philippines has long maintained high tariffs on raw and refined sugar imports, but Executive Order No. 892 reduced the tariffs under the ASEAN Free Trade Agreement (AFTA) – from 38% in 2010 to five percent (5%) in 2015. This reduction in AFTA tariffs is expected to significantly impact on Philippine sugar production and trade, as other ASEAN producers, particularly Thailand, enjoy lower production costs. Industry sources cite that in April 2013, a metric ton of Philippine sugarcane was sold for about US $ 55/MT while its Thai counterpart was sold at US $ 34/MT.  

New trade agreements are likely to render tariffs ineffective for protecting the country’s interests. The Common Effective Preferential Tariff-ASEAN Free Trade Area (CEPT-AFTA) of 1992 effectively brought down the average tariff range to 0 to 5 percent (0-5%). This includes sugar in the CEPT Inclusion List (CEPT IL) of the ASEAN 6 (the original members composed of Brunei, Indonesia, Malaysia, Philippines, Singapore, and Thailand). However, the Philippine government can always invoke a provision in the ASEAN Trade in Goods Agreement of 2009 (ATIGA) that allows an ASEAN member state to suspend tariff concessions or raise tariffs on rice and sugar when an import surge threatens domestic producers.

The Philippines has no General Competition Law and no Anti—Dumping measures in place, in the event of tariff-free imports beginning 2015 and beyond. There are no safeguards against the lower production costs of government-subsidized sugarcane among other ASEAN countries.

The domestic industry is also vulnerable to unfair competition due to smuggling. Weak border controls and corruption nurture illegal cross-border trade that impact on domestic supply and prices. For example, no official imports were expected for MY 2012/13 due to adequate sugar production but industry sources and newspaper articles reported the smuggling of sugar (and other crops) from Thailand ranging from 150,000 to 200,000 MT annually.

Overall, there is a need to improve productivity, enhance efficiency, and modernize infrastructure and facilities, especially milling and storage facilities.

What are the options to enhance competitiveness?

There are a number of viable options for enhancing industry competitiveness and bracing against foreign competition, both legal and illegal. These options require multi-stakeholder participation of government, millers, traders, wholesalers and retailers, processors, exporters, civil society, farmers, and farm workers.

1. Update and improve the milling efficiency of sugar mills. Millers have the financial means to upgrade their equipment and facilities. Mill performance has been on a downward trend partly due to disrepair of the mill itself. Improvements were observed when the Board of Investments (BOI) included sugar in the Investment

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16 ASEAN website at www.asean.org/asean-free-trade-afta-council
17 ASEAN website at www.asean.org
18 Ibid.
Priorities Plan (IPP) in 1992. The program provides incentives in the form of duty-free importation of equipment; there are 23 mills that took advantage of this.\(^\text{19}\)

2. Improve production efficiency. This includes efficient use of fertilizers, soil analysis, and proper selection of seeds. The findings of a study in Central Negros point out that sugar cane farmers could increase their output by 22% through better use of available inputs by rationalizing the use of NPK, especially N-fertilizer, and seed inputs. (http://www.issaas.org/journal/v15/01/journal-issaas-v15n1-padilla.pdf)

3. Mechanize production to address the decreasing number of cane planters and cutters/farm workers. Provide access to appropriate farming implements and equipment.

4. Rehabilitate and improve access to road networks. Transporting harvested cane from separate, isolated farms is usually uncertain owing to the lack of farm-to-mill roads, the absence of regular trucking, and the unfixed rate and cost of transport. All these must be addressed.

5. Provide access to updated, cost-efficient, and climate-resilient farming techniques, methods, and management. Many planters are not aware that they practice wasteful use of fertilizers and other available inputs. They also have the misconception that organic farming is time-consuming.

6. Promote participatory industry development planning. There is no record of intersectoral cooperation or integrated planning of big millers and traders involving small producers and enterprises.

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REFERENCES

AlterTrade Japan (ATJ) website at www.altertrade.co.jp/english.

ASEAN website at www.asean.org/asean-free-trade-afta-council.

Agricultural Production Loans. Monitoring and Evaluation Division, Agricultural Credit Policy Council, 10 July 2013.


http://www.issaas.org/journal/v15/01/journal-issaas-v15n1-padilla.pdf


USDA Gain, Philippines Sugar Annual 2013.
